

## PYOGENIC MENINGITIS — A STUDY OF 303 CASES

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There has been much controversy over the treatment of non-tuberculous bacterial meningitis which has been the subject of many papers and discussions in both paediatric and adult medicine.<sup>1-9,17</sup>

No satisfactory single antibiotic or combination of antibiotics has been generally accepted as ideal, whether given parenterally or orally, in combination with intrathecal therapy or without it. The mortality rate still remains fairly high in most series. The necessity for optimal therapy has been stressed by Banks *et al.*<sup>8</sup> and Alexander,<sup>7</sup> but they do not state what optimal therapy is. Continued study of the problem needs no further justification.

There have been few reports in the South African literature of treatment of meningitis, the most recent being one in 1958<sup>8</sup> and one in 1960.<sup>17</sup>

The cases of non-tuberculous bacterial meningitis at the City Hospital for Infectious Diseases, Cape Town, were studied over the 3-year period January 1955 - December 1957 and were divided into 4 main groups:

1. Meningococcal meningitis — 198 cases.
2. Purulent meningitis (signifying that no organisms were found on a smear stained by Gram's method, or were isolated on culture) — 61 cases.
3. Pneumococcal meningitis — 20 cases.
4. *H. influenzae* meningitis — 24 cases.

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There were also 1 case each of staphylococcal, *S. typhimurium* and *S. paratyphi* C meningitis but these will be excluded from the series, leaving 303 cases for consideration (Table I). It may be pointed out that non-meningococcal cases were admitted to the Infectious Diseases Hospital from general practitioners on the strength of their diagnosis of 'meningitis', and the type of infection, which would have excluded them, was not apparent until the cerebrospinal fluid was examined.

## MENINGOCOCCAL MENINGITIS

There were 198 patients in this series, their ages ranging from 1 month to 65 years (Table II). There were 45 patients less than 1 year of age, 94 between 1 and 10 years, and 59 more than 10 years of age (Table I). Of the 198 patients, 98 were male and 100 female; 34 were European, 148 Coloured and 16 African (Table II).

In 191 cases Gram-negative bean-shaped diplococci were seen on direct microscopic examination of the cerebrospinal fluid (96%), and were grown on culture in 64 cases. The organisms were sensitive in all cases to 'chloromycetin', streptomycin, 'aureomycin' and 'terramycin', but over the 3 years there were 12 instances where they were insensitive to penicillin.

At this hospital, until about the middle of 1956, the routine scheme of antibiotic treatment was penicillin with sulphadiazine for a period of 7-10 days. Sulphadiazine was given according to the scheme proposed by Banks.<sup>18</sup>

TABLE I. MORBIDITY AND MORTALITY FIGURES IN 303 CASES OF MENINGITIS

| Infection     | Age (years) | Cases    | Survival  | Deaths  | Morbidity | Complete recoveries | Survival excluding those who died within 24 hours |
|---------------|-------------|----------|-----------|---------|-----------|---------------------|---|
| Meningococcal | <1          | 45 (23%) | 44 (98%)  | 1 (2%)  | 1 (2%)    | 181<br>198 = 90%    | 186<br>189 = 98%                                  |
|               | 1-10        | 94 (47%) | 86 (91%)  | 8 (9%)  | 1 (1%)    |                     |   |
|               | 10+         | 59 (30%) | 56 (95%)  | 3 (5%)  | 3 (5%)    |                     |   |
|               | Total       | 198      | 186 (94%) | 12 (6%) | 5 (3%)    |                     |   |
| Purulent      | <1          | 10 (16%) | 9 (90%)   | 1 (10%) | 0         | 52<br>61 = 85%      | 53<br>55 = 96%                                    |
|               | 1-10        | 26 (43%) | 24 (92%)  | 2 (8%)  | 0         |                     |   |
|               | 10+         | 25 (41%) | 20 (80%)  | 5 (20%) | 1 (4%)    |                     |   |
|               | Total       | 61       | 53 (87%)  | 8 (13%) | 1 (2%)    |                     |   |
| Pneumococcal  | <1          | 10 (50%) | 9 (90%)   | 1 (10%) | 0         | 16<br>20 = 80%      | 17<br>18 = 94%                                    |
|               | 1-10        | 2 (10%)  | 2 (100%)  | 0       | 0         |                     |   |
|               | 10+         | 8 (40%)  | 6 (75%)   | 2 (25%) | 1 (13%)   |                     |   |
|               | Total       | 20       | 17 (85%)  | 3 (15%) | 1 (5%)    |                     |   |
| Influenzal    | <1          | 16 (67%) | 12 (75%)  | 4 (25%) | 1 (6%)    | 17<br>24 = 71%      | 19<br>23 = 83%                                    |
|               | 1-10        | 7 (29%)  | 6 (86%)   | 1 (14%) | 1 (14%)   |                     |   |
|               | 10+         | 1 (4%)   | 1 (100%)  | 0       | 0         |                     |   |
|               | Total       | 24       | 19 (79%)  | 5 (21%) | 2 (8%)    |                     |   |

TABLE II. RACE, SEX AND AGE DISTRIBUTION IN 303 CASES OF MENINGITIS

| Infection             | Race distribution |           |         | Sex       |           | Age          |
|-----------------------|-------------------|-----------|---------|-----------|-----------|--------------|
|                       | European          | Coloured  | African | Male      | Female    | Months-Years |
| Meningococcal .. .. . | 34 (17%)          | 148 (75%) | 16 (8%) | 98 (50%)  | 100 (50%) | 1 - 65       |
| Purulent .. .. .      | 13 (21%)          | 42 (69%)  | 6 (10%) | 39 (64%)  | 22 (36%)  | 2 - 52       |
| Pneumococcal .. .. .  | 3 (15%)           | 14 (70%)  | 3 (15%) | 12 (60%)  | 8 (40%)   | 4 - 40       |
| Influenzal .. .. .    | 5 (21%)           | 17 (71%)  | 2 (8%)  | 14 (58%)  | 10 (42%)  | 3 - 48       |
| Total .. .. .         | 55 (18%)          | 221 (73%) | 27 (9%) | 163 (54%) | 140 (46%) |              |

Because sulphonamides alone are not sufficient<sup>a</sup> and some organisms were reported insensitive to penicillin, chloromycetin was added as a routine antibiotic in the more severe cases from the middle of 1956. Intrathecally, penicillin and/or chloromycetin were given at the initial lumbar puncture if the cerebrospinal fluid was turbid. Lumbar punctures were done daily and intrathecal penicillin or chloromycetin was given until the fluid began to improve macroscopically and on laboratory analysis. From about April 1957, in the majority of cases, only 1 intrathecal injection of 1 or 2 antibiotics was given. Patients with the Waterhouse-Friderichsen syndrome were given intravenous 'solucortef' on admission, followed by cortisone for 8-10 days, with 'eucortone' given for 2 days.

There was a survival rate (Table I) of 94% with 12 deaths, the largest number of fatalities occurring in the 1-10-year group. There were 5 more cases with sequelae, the majority being in the over-10-year group, giving 181 complete recoveries out of 198 cases (90%). Excluding cases dying soon after admission, before therapy had a chance to be effective, there was a total of 189 cases of which 186 survived, giving a corrected survival rate of 98%.

#### PURULENT MENINGITIS

There were 61 patients with purulent meningitis (Table I), their ages ranging from 2 months to 52 years (Table II). Ten of them were below 1 year of age, 26 between 1 and 10 years, and 25 were more than 10 years old (Table I). Of the 61 patients, 39 were male and 22 female, 13 were European, 42 Coloured and 6 African (Table II).

Clinically, the majority appeared to be cases of meningococcal meningitis. Medical students are taught that in purulent meningitis, if no organisms are seen on smear or grown on culture, the likeliest infection is meningococcal. Often there was a history of the patient having received antibiotics before admission to hospital, usually 1 or 2 penicillin injections together with a few sulphonamide tablets. Many meningococci are sufficiently drug-sensitive to disappear from the cerebrospinal fluid on this treatment, whereas *H. influenzae* and *D. pneumoniae* are usually resistant to such minor therapy and are therefore more frequently seen on smear or grown on culture. For these reasons all the so-called purulent meningitides were treated as for meningococcal meningitis.

There was a survival rate (Table I) of 87%, with 8 deaths, the majority of which were in the over-10-years group. There was 1 further case with sequelae, leaving 52 complete recoveries out of 61 cases (85%). Six patients died soon after admission, leaving 55 cases of which 53 survived (96%).

#### PNEUMOCOCCAL MENINGITIS

There were 20 patients whose ages ranged between 4 months and 40 years (Table II); 10 were below 1 year of age, 2 between 1 and 10 years, and 8 over 10 years of age (Table I). Of the 20 patients, 12 were male and 8 female, 3 were European, 14 Coloured and 3 African (Table II).

The Gram-positive diplococcus was found in all cases on microscopy of the cerebrospinal fluid and was grown in 13 out of 19 cases where the CSF was cultured. In the 12 cases where sensitivity was reported all were sensitive to chloromycetin, aureomycin and terramycin; 92% were sensitive to penicillin; and 83% to streptomycin.

The routine therapy at this hospital for pneumococcal meningitis was penicillin, chloromycetin, and sulphadiazine as for meningococcal meningitis. Intrathecal therapy was given daily (in the milder cases penicillin alone, in the more severe cases penicillin and/or chloromycetin), until the cerebrospinal fluid had improved, i.e. the sugar was normal and there were no more than 30-40 cells per c.mm., mostly lymphocytes. Systemic treatment continued for a week thereafter. The average duration of intrathecal therapy was 10 days, and of general therapy, 19 days.

There was a survival rate (Table I) of 85% with 3 deaths, 2 of which were in the group over 10 years of age. The death in the patient below 1 year of age occurred within a few hours of admission. There was 1 case with sequelae, giving 16 complete recoveries out of 20 cases (80%). Excluding the cases dying within a few hours of admission, i.e. 2, there were 17 survivors out of 18 cases, a survival rate of 94%. Taking all the cases below 10 years of age, and excluding the child who died shortly after admission, there were 11 survivors out of 11 cases—a survival rate of 100%.

#### H. INFLUENZAE MENINGITIS

There were 24 patients (Table I), their ages ranging from 3 months to 48 years (Table II). The majority (67%) were less than 1 year old and there was only 1 case over 10 years of age (Table I). Of the 24 patients, 14 were male and 10 female, 5 were European, 17 Coloured and 2 African (Table II).

In 18 cases the organism was seen on direct microscopic examination, and in 20 cases *H. influenzae* was grown on culture. Of 19 cases where the sensitivity was tested all were shown to be sensitive to chloromycetin, streptomycin, and terramycin; 89% were sensitive to aureomycin and only 5% to penicillin.

The routine treatment for this type of infection was chloromycetin, streptomycin, and sulphadiazine, with chloromycetin and streptomycin given intrathecally daily.

Intrathecal therapy was continued as for pneumococcal meningitis. The average duration of intrathecal therapy was 12 days and of general therapy 20 days.

There was a survival rate (Table I) of 79% with 5 deaths, 4 of which occurred in the group less than 1 year of age. There were 2 cases with sequelae, leaving 17 complete recoveries out of 24 cases (71%). Excluding the case which died soon after admission, there were 19 survivors out of 23 cases, i.e. a corrected survival rate of 83%.

#### DISCUSSION

Meningococcal meningitis was almost invariably a fatal disease until antimeningococcal serum was introduced many years ago and a few cases were saved. Then came 'prontosil' which saved a few more, followed by sulphapyridine which made an even greater difference. As more sulphonamide preparations were introduced the mortality rate fell, as well as the side reactions to the sulphonamides. The target then became, not mere survival with or without sequelae, but complete recovery. That is the objective and the problem is how to attain it with the minimum of expense, therapeutic effort, and disturbance of the patient, while avoiding all risk of inadequate treatment.

Sulphonamides are not the final word in therapy of meningococcal meningitis, particularly if given alone.<sup>8</sup> Banks *et al.*<sup>9</sup> stated that the results of treatment of meningococcal meningitis with systemic penicillin and sulphonamides and intrathecal penicillin were satisfactory; yet they noted a survival rate of only 70-76%. Cathie and Simpkins<sup>7</sup> treated 51 cases of meningococcal meningitis with penicillin and sulphonamides, with 2 deaths (4%) and 6 cases with sequelae (12%), i.e. a survival of 96% and recovery of 84%. The present series shows survival of 94% and complete recovery in 92% of meningococcal infections. In the group of presumptive meningococcal cases, here classed as purulent meningitis, the figures are 87% and 85% respectively. A recent South African series<sup>8</sup> of comparable unidentifiable purulent cases in children, showed a recovery rate of 91%. It would seem that the remaining difficulty is the simplification of the treatment, since, with an infection of such potential virulence and rapidity, it is probably impossible to expect much further statistical improvement.

In pneumococcal meningitis most series overseas, including adults, report mortalities varying from 10% to 60%.<sup>10-12</sup> In Zilberg's series,<sup>8</sup> the mortality rate was 27% in infants and children. In the present series the overall mortality rate was 15% and excluding cases dying shortly after admission, it was 6%. Furthermore, excluding cases over 10 years of age, where the mortality rate is higher than in young children,<sup>13</sup> the survival rate was 100%. In the present series of 20 cases there was a complete recovery rate of 80%. This could probably be improved.

Meningitis due to *H. influenzae* remains a serious disease in spite of the advent of antibiotics and chemotherapeutic agents.<sup>1,2,8-10</sup> In Zilberg's series, the mortality rate was 26%.<sup>8</sup> In the present series, 21%. Only 71% made a complete recovery.

In searching for possible ways of improving on these results, the clinical manifestations and complications of the meningitides were reviewed. These features are shown

TABLE III. COMPLICATIONS ARISING IN 303 CASES OF MENINGITIS

| Complication                | Type of meningitis |          |              |            |
|-----------------------------|--------------------|----------|--------------|------------|
|                             | Meningococcal      | Purulent | Pneumococcal | Influenzal |
| Purpura .. ..               | 47 (24%)           | 14 (23%) | —            | —          |
| Herpes .. ..                | 25 (13%)           | 8 (13%)  | 1 (5%)       | —          |
| Arthritis .. ..             | 10 (6%)            | 4 (7%)   | —            | —          |
| Waterhouse-Friderichsen ..  | 9 (5%)             | 7 (12%)  | —            | —          |
| Coma .. ..                  | 6 (3%)             | 2 (3%)   | 3 (15%)      | 4 (17%)    |
| Cranial-nerve palsies .. .. | 9 (5%)             | 4 (7%)   | 4 (20%)      | 5 (21%)    |
| Hemiplegia .. ..            | 3 (2%)             | 1 (2%)   | 3 (15%)      | 4 (17%)    |
| Eye complications ..        | 6 (3%)             | —        | —            | —          |
| Sulphonamide haematuria ..  | 2 (1%)             | 1 (2%)   | —            | —          |
| Drug eruption ..            | 2 (1%)             | 1 (2%)   | 1 (5%)       | 1 (4%)     |
| Fits .. ..                  | 5 (3%)             | —        | 3 (15%)      | —          |
| Stupor .. ..                | —                  | —        | —            | 4 (17%)    |
| Mental deficiency ..        | —                  | —        | —            | 2 (8%)     |
| Subdural effusions ..       | —                  | —        | 2 (10%)      | 1 (4%)     |
| Abortion .. ..              | —                  | 1 (2%)   | —            | —          |
| Venous thrombosis ..        | —                  | 1 (2%)   | —            | —          |

No. of cases .. 90 (45%) 35 (57%) 11 (55%) 14 (58%)

in Table III. Apart from confirming other workers' conclusions<sup>8-10,12</sup> that coma and paralysis are of bad prognostic significance, the scrutiny does not seem helpful.

The duration of illness before admission gives more hope for the future. It is evident from Table IV that

TABLE IV. DURATION OF HISTORY IN DAYS

| Infection                  | Overall    |         | In those who died (average) |
|----------------------------|------------|---------|-----------------------------|
|                            | Variation  | Average |                             |
| Meningococcal .. ..        | Hours - 14 | 3       | 3.5                         |
| Purulent .. ..             | 1 - 10     | 3       | 3                           |
| Pneumococcal .. ..         | 1 - 27     | 7       | 13.5                        |
| <i>H. influenzae</i> .. .. | 1 - 28     | 11      | 22                          |

in the meningococcal and purulent types, the illness had been shorter than in the other two. In these types there was also little or no difference in the duration of illness in those who recovered and those who died. In pneumococcal and haemophilus infections, however, the deaths occurred in those who had been ill for a much longer time than the average for each group as a whole. It would appear possible, therefore, that greater suspicion of meningitis as a cause of illness might lead to earlier diagnosis and treatment and to considerable improvement in the outlook. The treatment must be applied in time and, so applied, it is demonstrably efficient.

None of these types of meningitis would appear to be avoidable, e.g. by immunization techniques. The therapeutic approach obviously gives hope of complete recovery for patients who have neither a fulminating illness nor one of long duration before treatment. The degree to which the treatment can be simplified remains to be seen and will be considered in another paper. The relative paucity of recent publications on the subject should not be interpreted as an indication that the non-tuberculous bacterial meningeal infections are no longer a menace. They are dangerous, but not because of any lack of therapeutic armament. Lumbar puncture, properly carried out, should



be a painless and minor procedure from both the patient's and the doctor's point of view and there is no reason why, in the presence of doubt as to the diagnosis, a specimen of spinal fluid should not be regarded in much the same way as a specimen of urine, particularly in infants and young children. Pandey's test for increased globulin content can be done at the bedside and a positive result would indicate the need for further immediate investigation. There is no other simple procedure for the certain detection of meningitis in its early stages. From the figures given it is obvious that in the pneumococcal and influenzal types of infection, earlier diagnosis is the key to more successful treatment.

#### SUMMARY

1. At the City Hospital for Infectious Diseases, Cape Town, 303 cases of pyogenic meningitis were studied over a 3-year period. They are reported in 4 groups—meningococcal, purulent, pneumococcal and haemophilus infections.

2. The survival rates were 94, 87, 85 and 79% respectively. Complete recovery was found in 90, 85, 80 and 71%.

3. Scrutiny of the clinical and therapeutic factors indicates that adequate treatment is now available but that delay in its application is a vital handicap.

4. Earlier suspicion and diagnosis of the illness is essential.

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### FORTHCOMING INTERNATIONAL MEDICAL CONFERENCES

*The Second International Conference of Human Genetics* will be held in Rome on 7-12 September 1961. The 7th International Congress of Neurology will also meet at this time and joint sessions have been arranged. The Conference will be held in the Conference Building of the Food and Agriculture Organization of the United Nations under the chairmanship of Prof. Luigi Gedda.

An exhibition of human genetics will be arranged, and arrangements have also been made to provide members with either the prepublished abstracts of the papers or the full proceedings or both. A ladies' and social programme has been arranged and also sightseeing tours.

Registration forms and applications to present exhibits must reach the Secretariat of the Conference not later than 31 March 1961. Applications to present papers should be in by the end of February 1961. Applications forms, etc. may be obtained from the Secretariat.

Round table discussions will be held on 'Inheritance of normal quantitative and qualitative human traits'; 'Hereditary diseases of sense organs'; 'Microbial and biochemical genetics'; 'Population genetics, mutation and natural selection'; and 'From Mendelian genetics to molecular genetics in Man'. Lectures will deal with 'Human genetics', 'Blood groups', 'Genetics of antibody formation (tissue transplantation, allergies, etc.)', 'Psychiatric genetics', and 'Clinical genetics'. Symposia to be held at the joint sessions will include 'Chromosome genetics—disarrangements in the sex-chromosome complement and in the autosomal chromosomes', 'Dermatoglyphics', 'Psychological and behavioural genetics', 'Cancer, leukaemia and ionizing radiations', 'Genetic counselling and public health' and 'Methods in human genetics'.

Information, application forms, etc. may be obtained from the Secretariat of the Second International Conference of Human Genetics, Instituto 'G. Mendel', 5 Piazza Galeno, Rome, Italy.

*The Seventh International Congress of Neurology* will be held in Rome on 10-15 September 1961 under the auspices of

the World Federation of Neurology and the National Institute for Nervous Diseases and Blindness of Bethesda.

Subjects to be dealt with include: 'Neurologic disorders in porphyria, phenylketonuria and galactosuria'; 'Neurologic disorders related to liver diseases'; 'Brain disturbances associated with cardiopulmonary disorders'; and 'Aphasia'. Symposia on 'Lipids, lipoproteins and their metabolism' and 'Changes in myelin' will be held as well as a symposium on neurogenetic genetics in conjunction with the Third International Conference of Genetics. Other symposia will deal with neurologic geography, history of neurology, and multiple sclerosis.

All communications in connection with the presentation of papers must reach the Secretariat by 15 March, in triplicate text and with an English summary of 500 words.

Information in connection with this Congress may be obtained from the Secretary General, Dr. Giovanni Alemà, Viale Università 30, Rome.

*The Sixth International Congress on Mental Health*, organized under the auspices of the World Federation for Mental Health, will be held in Paris on 30 August-5 September 1961. The main themes of the Congress will be those of World Mental Health Year, 1960: 'The needs of children and youth', 'National surveys in the field of mental health and ill health', 'Teaching of the principles of mental health', 'Mental health and the sociological aspects of industrial change', 'Mental health and migrations', and 'Mental health and old age'. Key-note addresses by distinguished speakers on present-day problems, fields of activity and priorities for future work will make up part of the programme. There will also be general reports on the six Congress themes in which an attempt will be made to summarize the state of present knowledge in each field and other addresses bearing on the main Congress themes and other topics. The official languages of the Congress will be English, French and Spanish.

Further information may be obtained from: Secrétariat du VI<sup>e</sup> Congrès International de Santé Mentale, Ligue Française d'Hygiène Mentale, 11 rue Tronchet, Paris VIII<sup>e</sup>, France.

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# South African Medical Journal : Suid-Afrikaanse Tydskrif vir Geneeskunde

EDITORIAL : VAN DIE REDAKSIE

## THE EXCITING CAUSE IN CORONARY OCCLUSION

The opinion used to be generally held that physical exertion was a common proximate cause of coronary occlusion. Among those who have opposed this view is Master of New York, who, with his co-workers, has for many years been observing and documenting confirmed cases of coronary occlusion—exceeding two thousand in number—and has written a number of articles on the subject. At the 1960 annual meeting of the American Medical Association, he read a paper<sup>1</sup> presenting evidence from his records that exertion plays no important part in precipitating the attack in coronary occlusion.

Master emphasizes that this conclusion does not apply to the other form of acute coronary episode—acute coronary insufficiency without occlusion—in which in fact exertion plays an unquestioned rôle. Attacks of coronary insufficiency sometimes cause death; it is in general a relatively benign condition in comparison with coronary occlusion. When the insufficiency is severe enough to lead to infarction, this is confined to local areas in the subendocardial region and the papillary muscles, in contrast to the 'through-and-through' infarction that results from coronary occlusion. Master holds that failure to distinguish between these two forms of 'heart attack' was largely responsible for the mistaken views held in the past about the part played by effort and exertion in the precipitation of coronary occlusion.

In 1,248 cases Master recorded the period of the day when the attack began. He found that in 52.9 per cent. of the cases the onset was between 7 a.m. and 7 p.m. 'If effort were a factor one would expect the percentage of attacks occurring during the working hours to be much higher than 52.9'.<sup>1</sup>

In 603 cases the patient was able to pinpoint the hour of onset; the greatest number of attacks (42) began at 2 a.m., and the next in order were 35 at 10 p.m. and 33 at 11 p.m. 'These are ordinarily not working hours'.<sup>1</sup> The day of the week was recorded in 398 cases. The highest incidence was on Monday (17.1 per cent.) and the next on Tuesday (16 per cent.); but the third was on Sunday (15.8 per cent.), and the incidence on Saturday (13.0 per cent.) was higher than on Wednesday (12.0 per cent.) and Friday (11.0 per cent.). 'One can only deduce that coronary occlusion occurs no more frequently on working days than on holidays'.<sup>1</sup>

In 1639 cases of coronary occlusion the type of activity

or inactivity of the patient at the time of the attack was recorded. It was found that 27.2 per cent. occurred during 'rest' (lying down or sitting), 25.6 per cent. during 'mild activity' (including ordinary home activities, being in the office, 'store', or car, and driving a car), and 22.9 per cent. during sleep. On the other hand, 13.2 per cent. occurred during walking (on the street, up or down stairs, after meals, against a cold wind, and while carrying a 'bundle'), 9.0 per cent. during 'moderate activity' (e.g. the work, other than merely walking, regularly performed by painters, carpenters, engineers, and bakers), and 1.9 per cent. during unusual or severe exertion (e.g. lifting or moving a heavy load, playing football, swimming, dancing, and skating). 'To us this adds up to the conclusion that coronary occlusion takes place irrespective of the physical activity being performed or the type of rest taken'.<sup>1</sup>

Master concludes from these analyses that physical exertion is not an exciting cause of coronary occlusion, 'which is the end result of an atherosclerotic process and occurs independently of external influences'. He adds that we 'know neither the cause of the acute coronary occlusion nor how to prevent it'.<sup>1</sup>

A distinction, of course, is to be drawn between the causation of coronary atherosclerosis and the proximate cause of coronary occlusion. Both factors are operative in the occupational aetiology of coronary occlusion. This aetiology Master investigated in 1,377 of his cases where the information was available, and found that there was a greater proneness to coronary occlusion in the 'white-collar' and professional occupational groups than in manual workers and unskilled labourers. These figures, however, do not show as great an excess as Morris *et al.*<sup>2</sup> recorded in England in the mortality rates from coronary disease in physically light occupations over the rates in the heavy-labour classes.

Master, indeed, attributes much of the increase in the recorded mortality rates from coronary disease to the aging of the population, improved diagnosis, a healthy index of suspicion, and changes in the classification and recording of heart disease. 'However,' he writes, 'it has not reached epidemic proportions, nor is it caused by the "stress and strain" of modern life.' In particular, he denies that it is to be regarded as especially the "doctor's disease".

The causation of atheroma is still the crux of the problem.

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## REGISTER VAN MEDIESE VERGADERINGS

Die 43ste Suid-Afrikaanse Mediese Kongres sal gedurende hierdie jaar (24 - 30 September) in Kaapstad gehou word. Behalwe hierdie tweejaarlikse kongresse wat deur die Vereniging gereël word, word daar gereeld 'n groot aantal kongresse, samesprekings, en vergaderings gehou deur groepe in die Vereniging en deur ander mediese organisasies. Liggame soos byvoorbeeld die Suid-Afrikaanse Rooi-

kruisvereniging, die Nasionale Raad vir Blindes, en andere, hou gereeld vergaderings in verskillende dele van die land. Sulke vergaderings is gewoonlik van groot belang vir geneeshere.

Akademiese aktiwiteit van hierdie aard is baie welkom en moet aangemoedig word. Aangesien daar egter so 'n

groot toename is in die aantal kongresse en byeenkomste, vind oorvleueling van datums al hoe meer plaas. Dit is wel waar dat sekere byeenkomste net bedoel is vir gespesialiseerde groepe, maar daar is baie ander byeenkomste waarin dokters uit alle lae van die professie belangstel. As die datums van hierdie byeenkomste bots, veroorsaak dit ongerief, en dokters moet dikwels die moeilike besluit neem oor watter byeenkomste om by te woon en watter nie.

Behalwe akademiese vergaderings is daar ook gereelde byeenkomste van die Federale Raad van die Mediese Vereniging, die Suid-Afrikaanse Geneeskundige en Tandheelkundige Raad, en ander liggame. As hierdie byeenkomste bots met ander van 'n akademiese aard, kan dit ook aanleiding gee tot ongerief. Onlangs is daar byvoorbeeld in Johannesburg drie belangrike mediese byeenkomste gelyktydig gehou, en baie dokters was teleurgesteld omdat hulle moes kies en nie in staat was om al drie by te woon nie.

'n Ander aspek van die probleem is die aansienlike afstand tussen die groot sentrums in ons land waar die vergaderings gewoonlik gehou word. Alhoewel die faktor van afstand van minder belang word as gevolg van lugreise, vind besige dokters dit nogtans moeilik om van een

stad na 'n ander te vlieg om een of meer vergaderings binne 'n bepaalde aantal dae by te woon.

Dit sou 'n eenvoudige oplossing van die probleem wees as 'n sentrale register van mediese vergaderings gehou kon word. Enige groep in die Vereniging of enige ander mediese of verwante liggaam wat 'n byeenkoms wil reël, kan dan die voorgestelde datum en plek van byeenkoms vóór die tyd aanstuur vir opname in die register. Die organiseerders kan dan in kennis gestel word of die gegewens inpas by ander reëlins. Indien dit nie die geval is nie, kan alternatiewe aanbevelings gemaak word. Ons wil dit graag sterk aanbeveel dat alle belangstellende liggame hulle aandag aan hierdie voorstel skenk.

Die Sekretaris van die Mediese Vereniging by die hoofkantoor van die Vereniging in Kaapstad het te kenne gegee dat hy gewillig sal wees om so 'n register van vergaderings te hou. 'n Lys van die voorgestelde byeenkomste kan dan van tyd tot tyd in die *Tydskrif* geplaas word ter algemene inligting.

Die menings van alle moontlike betrokke partye in hierdie verband sal graag ontvang word. As die idee gunstig ontvang word, sal stappe gedoen word om so 'n register so gou as moontlik in te stel.

### CENTRAL REGISTER OF MEETINGS

This year the 43rd South African Medical Congress will be held. Apart from such major biennial congresses organized by the Medical Association, the many Groups within the Association, as well as other medical bodies, hold frequent congresses, symposia and meetings of their own. Organizations such as the South African Red Cross Society, the National Council for the Blind, and others, hold meetings in various parts of the country which are of interest to medical men.

This academic activity is a sign of professional maturity and is to be highly commended. However, with the increasing frequency of these congresses and meetings, overlapping of dates is common. It is true that some specialized congresses are of interest only to members of the specialty concerned, but there are many which doctors from all ranks of the profession wish to attend. If the dates of these meetings clash, much irritation is caused, and doctors have to make what is sometimes a difficult choice between several important subjects.

Apart from these academic meetings, there are regular meetings of the Federal Council of the Medical Association, the South African Medical and Dental Council, and other bodies. If these meetings clash with others of an academic nature the same difficulty arises. Recently, in Johannesburg, three important meetings were held simultaneously, and many doctors were disappointed that they had to choose between them and were not in a position to attend all three.

Another aspect of the difficulty is the distance between the large centres in this country where the meetings are held. Admittedly, air travel has made distance of little consequence, but a busy doctor finds it onerous to have to fly from one centre to another to attend two or more meetings within a matter of days.

A simple solution to the problem would be to keep a central register of medical meetings. Any Group within the Association or any other medical or para-medical body which intends to hold a congress or meeting could submit the proposed date and venue *in good time* to the central registry. The organizers would then be informed whether the date and venue was likely to clash with any other previously-arranged meeting and could be given a suitable alternative suggestion. We strongly urge that all interested bodies agree to make use of such facilities.

The Secretary of the Medical Association has intimated that the Head Office of the Association in Cape Town would be willing to be responsible for keeping a register of meetings; a list of such meetings could then be published from time to time in the *Journal* for general information.

The views and comments of all groups and other interested bodies concerning this proposal are invited; if it meets with general favour steps will be taken to implement it as soon as possible.

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## PROFOUND HYPOTHERMIA AND THE HELIX RESERVOIR BUBBLE OXYGENATOR

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The success of open intracardiac surgery depends, to a large extent, on whether the technique used allows an accurate, unhurried correction of the lesion, and also on whether the procedure can be completed with a minimum of myocardial damage and without a significant change in the internal environment of the patient.

At normal body temperature this is possible to some extent by employing high-flow perfusion and cardiac asystole—a quiet heart being necessary for the accurate repair of the more complex lesions, and the high flow for normal oxygenation and metabolism—but both these techniques give rise to certain problems which hamper the surgeon in attaining his ultimate goal.

For example, when maintained for any length of time, the cardiac asystole causes myocardial damage, and high-flow perfusion causes excessive blood destruction and often prevents the surgeon from obtaining a bloodless field, especially in cyanotic patients with rich bronchial collateral circulation.

In an attempt to obtain ideal conditions the value of hypothermia used in conjunction with the pump oxygenator was investigated in various centres. The extracorporeal circulation abolishes the dangers of deep hypothermia to the myocardium, while the profound reduction in body temperature, and thus in body metabolism, allows much lower flow rates, resulting in drier operating conditions. It has been shown that hypothermic arrest of the heart is superior to potassium or anoxic arrest in maintaining myocardial energy resources, with the result that myocardial damage is less likely during the period when a quiet heart is necessary for the accurate repair of the defect.

Our experimental studies, and those of other workers, have shown that cold *per se* is not harmful, and that its effects can always be reversed. This paper deals with our clinical experience with hypothermia of 20°C. or lower in conjunction with the bubble oxygenator.

### MATERIAL

From July to October 1960, 25 patients suffering from various congenital and acquired heart defects were operated on using this technique. Only patients with the more severe anomalies were selected and therefore atrial septal defects, isolated pulmonary stenoses and uncomplicated ventricular septal defects were not included in this series, since we still prefer to operate on these cases with high-flow normothermic perfusions.

In order to analyse the results and obtain a more accurate impression of the value and dangers of this technique, we have divided the patients into 2 groups. The first includes those patients in whom anatomical correction was possible (Table I), and the second group those in whom anatomical correction was not possible by reason of the nature of the defect (Table II). Thus the second group includes anomalies such as transposition of the

great vessels, Ebstein's anomaly, tetralogy of Fallot with pulmonary arterial hypoplasia, and multiple cardiac lesions.

### APPARATUS

The extracorporeal circuit is basically that which we have previously described for normothermic perfusions,<sup>1-3</sup> except that the venous blood is drained directly into the

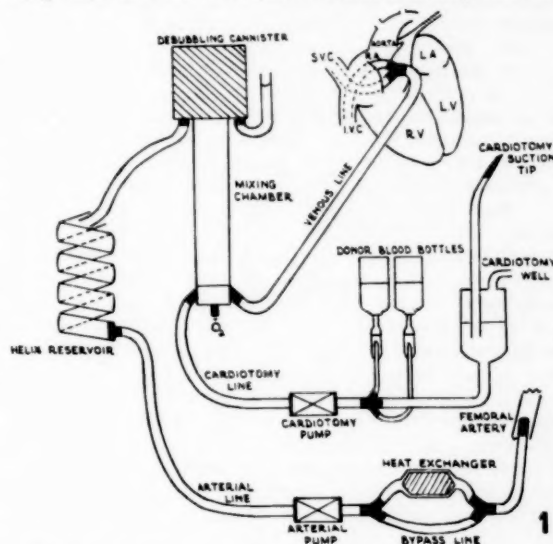


Fig. 1. The extracorporeal circuit employed with profound hypothermia and the bubble oxygenator.

mixing chamber, thus dispensing with the venous pump (Fig. 1). Since the patient's temperature is controlled by means of a heat exchanger in the arterial line, the helix reservoir is not immersed in a water bath.

A Bennington heat-exchange unit is used. This works on the principle that the blood entering it is spread in a thin film over a highly-polished inner component and so comes into contact with the similarly polished inner wall of the jacket carrying the heat exchange fluid. Water from a tank containing melting ice is used for cooling, and water between 40° and 45°C. for rewarming. The water is pumped through the jacket at a rate of 12 gallons per minute.

The number of heat-exchange units employed depends on the weight of the patient. Thus, for patients weighing up to 20 kg., 1 unit is adequate, for patients between 20 and 40 kg., 2 units, and for those over 40 kg., 3 units are used. When more than 1 unit is employed they are placed in parallel, not in series, thus reducing the resistance in the arterial line. In order to keep the patient's temperature

constant at the desired level, a line bypassing the heat exchanger is also incorporated in the arterial line.

#### TECHNIQUE

Anaesthesia, except for the hypothermic stage, is similar to that for operations involving normothermic perfusions.

During the hypothermic stage anaesthetic drugs are not needed, since 'cold narcosis'—as shown by complete electro-encephalographic (EEG) inactivity—is present. It is only during the precooling and warming periods of the bypass, when EEG activity is present, that drugs may be necessary.

Exposure for the operation is obtained by means of a median sternotomy. The preparations for cardiopulmonary bypass are as described previously,<sup>1-3</sup> except that both venae cavae are catheterized through the right atrial appendage, and the catheters are secured by means of a Rommel clamp. The arterial line is taken back to the patient through a stainless steel catheter in the right common femoral artery, except in children under the age of 18 months. In these small babies we find the common femoral, external iliac or common iliac arteries to be too small to take a catheter with an adequate internal diameter and therefore the arterial catheter is inserted through the ascending aorta with the tip pointing towards the aortic valve.

As soon as bypass is begun, the tapes round the venae cavae are tightened so that the patient's heart is completely bypassed. The flow rate during the period of cooling is estimated on the basis of 2.4 litres per square metre per minute for patients with a body surface up to 1 square metre and, for those with a greater surface area, 2.1 litres per square metre per minute. Unlike previous reports,<sup>4,5</sup> we cool on complete bypass with high flow rates. This has the advantage that the heart can be opened immediately and also that cooling is more rapid.

When the mid-oesophageal temperature reaches 20°C, the flow rate is reduced to one-third of the initial flow and

maintained there throughout the cooled phase, unless for technical reasons the flow is stopped completely. When the desired temperature is reached, it is kept constant by allowing blood to flow through either the heat exchanger or the bypass line, as required.

Rewarming is commenced about 10 minutes before completion of the intracardiac repair, and the heart beat is restarted before the cardiectomy is closed, to permit decompression of the non-beating heart with the cardiectomy suckers, thus avoiding over-distension of the relaxed myocardium.

Since the flow rate is low during the cooled phase, the blood returning through the coronary sinus does not obscure the operative field and we therefore allow flow through the coronary vessels throughout the operation, except when tying sutures in a ventricular septal defect. For this, a completely relaxed heart is necessary and this is only possible when the aorta is cross-clamped and the myocardium is completely free of blood.

During rewarming the flow rate is rapidly increased until full flow is reached, thus shortening the rewarming time.

Bypass is discontinued as previously described.<sup>1-3</sup>

#### RESULTS

##### Survival

In Group I (Table I), 3 of the 18 patients did not survive. In case 10 a tracheotomy was required early in the postoperative phase to deal with excessive bronchial secretions; on the tenth postoperative day a fistula developed between the mediastinum and the tracheotomy wound and the patient died 24 hours later from an undetected air tamponade. Case 9 succumbed to a pulmonary embolus on the fifth postoperative day and case 13 died during surgery from aortic incompetence, following an attempt to correct a calcific aortic stenosis plus incompetence. None of these deaths can thus be blamed on the hypothermic technique.

TABLE I. LESIONS ANATOMICALLY REPAIRABLE BY PRESENT TECHNIQUES (GROUP I)

| No. | Case   | Race/Sex/Age | Weight<br>in kg. | Lesion                            | Flow rates<br>(ml. per min.) |       | Lowest<br>mid-oesophageal<br>temp.<br>in °C. | Duration<br>of<br>bypass<br>in mins. | Outcome  |
|-----|--------|--------------|------------------|-----------------------------------|------------------------------|-------|--|--------------------------------------|----------|
|     |        |              |                  |                                   | Min.                         | Max.  |  |                                      |          |
| 1   | J.P.   | EM 5½ years  | 15               | Tetralogy of Fallot ..            | 880                          | 1,536 | 15   | 113                                  | Survived |
| 2   | D.M.   | EM 15 years  | 50               | VSD + pulm. infund. stenosis ..   | 1,000                        | 3,250 | 18   | 72                                   | Survived |
| 3   | I.P.   | EM 21 years  | 64               | VSD + pulm. infund. stenosis ..   | 1,000                        | 3,822 | 18   | 85                                   | Survived |
| 4   | P.N.   | EF 4 years   | 12               | VSD .. .. .                       | 800                          | 1,320 | 19   | 92½                                  | Survived |
| 5   | M.M.   | CM 14 years  | 45               | VSD + pulm. infund. stenosis ..   | 1,672                        | 2,940 | 20   | 93                                   | Survived |
| 6   | B.B.   | CM 22 years  | 65               | VSD .. .. .                       | 1,760                        | 3,700 | 17   | 67                                   | Survived |
| 7   | M.N.   | AM 23 years  | 50               | Tetralogy of Fallot ..            | 1,760                        | 3,255 | 17   | 126                                  | Survived |
| 8   | B.S.   | EM 15 months | 2.3              | Tetralogy of Fallot ..            | 600                          | 1,150 | 17   | 41                                   | Survived |
| 9   | D.duP. | EM 30 years  | 82               | VSD + pulm. infund. stenosis ..   | 1,200                        | 3,870 | 19   | 131                                  | Died     |
| 10  | G.E.   | EM 4½ years  | 16               | VSD + pulmonary hypertension      | 880                          | 1,800 | 16   | 73                                   | Died     |
| 11  | F.M.   | EF 31 years  | 53               | Acquired AS + AI ..               | 1,000                        | 2,700 | 14.9   | 97                                   | Survived |
| 12  | A.S.   | EM 8 years   | 18               | Tetralogy—re-operation on VSD     | 1,000                        | 2,100 | 14.4   | 57                                   | Survived |
| 13  | G.T.   | EM 31 years  | ?                | Calcific AS + AI ..               | 1,269                        | 3,710 | 14.8   | 240                                  | Died     |
| 14  | J.B.   | EM 27 years  | 59               | VSD + AI .. .. .                  | 1,800                        | 3,650 | 15   | 120                                  | Survived |
| 15  | A.v.R. | EF 20 months | 8                | Idiopathic pulmonary hypertension | 700                          | 960   | 24   | 70                                   | Survived |
| 16  | V.M.   | CM 3 years   | 9                | Tetralogy of Fallot ..            | 440                          | 1,200 | 17   | 117                                  | Survived |
| 17  | M.S.   | EF 9½ years  | 23               | VSD + PDA .. ..                   | 800                          | 2,118 | 17   | 130                                  | Survived |
| 18  | C.McL. | CF 30 years  | 50               | AS + MI .. .. .                   | 1,000                        | 3,150 | 19.1   | 128                                  | Survived |
| 19  | A.C.   | CM 16 years  | 23               | Tetralogy of Fallot ..            | 616                          | 2,000 | 15.3   | 101                                  | Survived |

VSD=ventricular septal defect, pulm. infund. stenosis=pulmonary infundibular stenosis, AS=aortic stenosis, AI=aortic incompetence, PDA=patent ductus arteriosus, MI=mitral incompetence, E=European, C=Coloured, A=African.



The mortality in Group II (Table II), where an anatomical correction was not possible, was 100%. This also cannot be attributed to the perfusion technique. Three patients with tetralogy of Fallot malformation and hypoplasia of the main pulmonary artery are included in this group, since complete correction in one operation is not possible. We agree with Brock<sup>8</sup> that these defects should be corrected in two stages: at the first stage the right ventricular outflow obstruction is relieved and, after several months, when the pulmonary vessels have had time to develop due to the increased flow through the pulmonary circuit, the ventricular septal defect can be closed, at a second operation. In cases 8 and 16 in Group I, this was done with excellent results, after the first stage operation. The second operation, of course, has not yet been performed.

#### ADVANTAGES

##### 1. Hypothermic Arrest of the Heart

In all the patients in this series ventricular fibrillation ensued when the myocardial temperature dropped below 25°C. The fibrillation became less vigorous as the temperature dropped, but continued unless the aorta was cross-clamped or bypass was discontinued. A quiet operative field was thus obtained by hypothermic arrest without the use of anoxia or drugs, thus avoiding the deleterious effects of those techniques.<sup>7</sup>

##### 2. Bloodless Operative Field

This, to our minds, is one of the greatest advantages of profound hypothermia. The low flow rate reduces the amount of blood that rushes to the heart via the coronary sinus and the bronchial collateral vessels. This small return can easily be taken care of by the intracardiotomy suckers. Furthermore, bypass can be stopped completely, thus producing a dry heart, if desired.

##### 3. Diminished Danger of Metabolic Acidosis in Long Perfusions

During normothermic bypass with high-flow perfusions the pH is maintained at a fairly constant level by the efficient elimination of CO<sub>2</sub> by the oxygenator. There appears to be a decrease in this function during prolonged perfusions. Base bicarbonate falls in a fairly regular

fashion and it must be assumed that fixed acid excess is the cause of the base deficiency. Eventually there is a drop in the pH.

In profound hypothermia our experience has shown that in all the patients perfused for more than 1 hour, the pH remained constant and the base bicarbonate only dropped below 20 mEq. per litre in 2 patients out of 21.

It appears that profound hypothermia, even at the low flow rates employed during the cold phase, prevents accumulation of acid metabolites and decreases the danger of metabolic acidosis.

##### 4. Safety Margin Provided by Profound Hypothermia

In high-flow normothermic perfusions, little time is allowed during bypass for any mechanical breakdown in the heart-lung machine, e.g. electricity failure, pump failure, etc. With profound hypothermia an interruption of perfusion for 30 minutes or more is tolerated and, during this time, any breakdown can be repaired. In fact, if it came to the worst, there would be enough time to convert the perfusion technique to the Drew technique.<sup>9,10</sup>

If a patent ductus arteriosus is diagnosed when the right ventricle is opened, this troublesome mistake in pre-operative diagnosis does not present any problem. The shunt into the pulmonary artery can be controlled by the surgeon introducing his finger into the pulmonary artery to block the opening of the ductus until profound hypothermic levels are reached. At that stage the circulation can be stopped completely and the ductus dissected and ligated.

#### DISADVANTAGES

##### 1. Longer Perfusions

The time needed to reach and then reverse the profound hypothermia lengthens the total extracorporeal perfusion time. In our experience, profound hypothermia adds between 20 and 30 minutes to the total perfusion time; however, with more experience and better organization this disadvantage could be eliminated. Moreover, the quiet and bloodless operative field facilitates the closure of the ventricular septal defect or the reconstruction of the hypoplastic pulmonary artery in severe tetralogies. This shortens the total time required and is some compensation.

TABLE II. LESIONS ANATOMICALLY IRREPAIRABLE BY PRESENT TECHNIQUES (GROUP II)

| No. | Case | Race/Sex/Age | Weight<br>in kg. | Lesion   | Flow rates<br>(ml. per min.) |       | Lowest<br>mid-oesophageal<br>temp.<br>in °C. | Duration<br>of<br>bypass<br>in mins. | Outcome |
|-----|------|--------------|------------------|--|------------------------------|-------|--|--------------------------------------|---------|
|     |      |              |                  |  | Min.                         | Max.  |  |                                      |         |
| 1   | M.S. | MM 40 years  | 41               | Tetralogy of Fallot. Hypoplastic pulmonary artery  | 1,320                        | 3,000 | 18   | 176                                  | Died    |
| 2   | M.C. | EF 9 months  | 2.3              | Complete ECD with both pulmonary arteries and aorta arising from one ventricle. Hypoplastic pulmonary artery | 300                          | 600   | 16.1   | 114                                  | Died    |
| 3   | S.M. | CF 1 year    | 2.4              | Tetralogy of Fallot. Hypoplastic pulmonary artery  | Pump off                     | 480   | 14   | 58                                   | Died    |
| 4   | S.J. | CF 8 years   | 15               | Tetralogy of Fallot with hypoplasia of MPA and branches  | 600                          | 1,600 | 16.4   | 234                                  | Died    |
| 5   | L.K. | CF 14 days   | 3                | Ebstein's anomaly with 2 ostium secundum atrial septal defects + large PDA                                   | 520                          | 700   | 14   | 61                                   | Died    |
| 6   | J.S. | EM 3 months  | 4                | Transposition of great vessels + patent foramen ovale  | Pump off                     | 480   | 10   | 74                                   | Died    |

ECD=endocardial cushion defect, MPA=main pulmonary artery, PDA=patent ductus arteriosus, M=Malay, E=European, C=Coloured.

### 2. Greater Blood Destruction

In our experience with the bubble oxygenator the haemolysis depends more on the length of perfusion than on the volume of flow. Therefore, with profound hypothermia—due to the longer period of bypass—the postoperative plasma haemoglobin levels were higher than with normothermic perfusions. This, however, has not been the experience of other workers employing disc and screen oxygenators.

### 3. Postoperative Renal Failure

Two of the patients in this series developed, post-operatively, the signs associated with tubular necrosis. In 120 normothermic perfusions we did not experience this complication and it was therefore decided to study the effects of profound hypothermia on the kidneys. This will be the subject of another report. It appears that kidney function returns to normal as soon as rewarming has taken place.

### 4. Postoperative Morbidity

It has been our experience that postoperative bleeding is more troublesome in the hypothermic cases than in the normothermic ones, and in this series there were 3 patients who had to be taken back to the operating theatre to control the bleeding. The disturbing feature is that the bleeding in all 3 cases started several hours after completion of the operation and the reason for this certainly requires further study.

#### CONCLUSIONS

Our experimental and clinical experience makes us believe that this technique has a very definite place in the repair

of the more complicated cardiac lesions. The justification for its use in the simpler defects will come, if it does, only with more clinical and experimental experience.

In conclusion we would like to reiterate the statement made in a recent publication:<sup>8</sup> 'So far, the number of patients subjected to deep hypothermia is small . . . It may be some years before one can safely steer between the first rush of pioneer enthusiasm and over-biased inhibitory conservatism'.

We wish to thank Prof. J. H. Louw of the Department of Surgery, University of Cape Town, for his encouraging support of our work, and the technical staff, Mr. C. C. Goosen, Mr. C. J. Lockett and Mrs. V. M. Connell, for their many hours of invaluable assistance with this project. We are also grateful to the Medical Superintendents of the Groote Schuur and Red Cross War Memorial Children's Hospitals, Drs. J. G. Burger and J. F. W. Mostert respectively, for permission to report details of these cases. We are furthermore indebted to the Dr. C. L. Herman Research Fund of the University of Cape Town for financial support for this work.

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## VERDERE DRAGTIGHEIDSDATA VAN ANOPHELES GAMBIAE GILES IN TRANSVAAL\*

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By vorige geleenthede<sup>2-4</sup> het ons 'n vereenvoudigde dragtigheidstechniek beskryf om vas te stel of fisiologiese weerstand van *Anopheles gambiae* teen BHC aanwesig is. Ons het ook sekere berekenings gemaak met betrekking tot malaria-uitwissing. Dit is bereken dat hierdie vektor blykbaar onder sekere omstandighede gemiddeld elke 2-2 dae eiers lê; 4-9 uur lank in 'n onbespuite hut sit voordat sy byt; dat sy in gemiddeld 4-3 uur uitgeslaan word deur BHC in bespuite hutte; dat BHC-hutbespuiting 6 maande lank doeltreffend bly; en dat fisiologiese weerstand teen BHC in die Transvaal afwesig is.

#### VERDERE GEGEWENS

Deur rusplekke van *gambiae* vanaf die begin van November 1958 tot die end van April 1959 in die Nylstroom-substreek met 'pyagra' te bespuit, is verdere gegewens wat in Tabel I opgesom is, verkry. Die dragtigheid, soos aangetoon, is in die laboratorium deur diseksie vasgestel.

Die groot totaal van al die rusplekke waaruit monsters vir die huidige ondersoek versamel is, is 178, en word in deel A van Tabel I aangegee. In deel B word hierdie

\* Gepubliseer met toestemming van die Sekretaris van Gesondheid, Pretoria.

totaal opgebreek in 130 hutte en 48 ander rusplekke. In deel C kry ons die genoemde 48 ander rusplekke weer verdeel in 30 verskillende rusplekke en 18 dongas. Van die 30 verskillende rusplekke is slegs 2 versamelings in gras, en 1 in 'n oond spesifiek aangestip, terwyl die oorblywende 27 bestaan uit uit mieliehoekke, afdakke, beeskrale en bokkrale.

#### INTERPRETASIES

Volgens Tabel I vind ons:

##### 1. Wyfies

(a) Vir die groot totaal van 178 rusplekke waaruit *gambiae* versamel is, is daar 9 ongevoede wyfies, en 'n totaal van 79 gevoede en dragtige wyfies—dus 'n verhouding van ongevoedes tot gevoedes en dragtiges van 1:9.

As ons nou die syfers van deel A soos opgebreek in dele B en C, apart ontleed, kom hierdie verhouding van 1:9 nog duideliker op die voorgrond:

(b) In geval van die 130 onbespuite hutte is die verhouding van ongevoedes: gevoedes en dragtiges, weereens 1:9.

Nou blyk dit belangrik dat hierdie verhouding wat nog verder weer gedurende die huidige ondersoek gevind is, reeds onafhanklik deur vorige gegewens uit dieselfde Nylstroom-substreek bevestig word:<sup>4</sup>

Gedurende die huidige ondersoek is daar 130 hutte en dragtige wyfies van 1:10.

Februarie langer, en tot April. *gambiae* in om te voedsel dus die verhouding ondersoek.

Ons besig is, om te bevestig is, om te verhoed.

(c) Vir gesit is, 1 ongevoede ons dus, i derde keer.

(d) In d 30 verskillende dragtigtes sondering hierdie en.

(e) Vir dragtigtes verklaar d se broeiple die verhouding wies was die verhouding.

(f) Vir 'n v at donga verhouding 30 verskillende.

(g) Dit die gemiddelde vir die 48.

Ons be die verhouding wies, w.

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Gedurende Februarie en Maart 1958 is in 144 onbespuite hutte 'n totaal van 13 ongevoede naas 130 gevoede en dragtige *gambiae* wyfies gevind; dus 'n verhouding van 1:10. 'n Eenvoudige berekening toon dat gedurende Februarie en Maart die dae gemiddeld korter, nagte langer, en temperature laer is as gedurende November tot April. Hierdie klimaatsfaktore verduidelik waarom *gambiae* in Februarie en Maart 1958 langer geneem het om te voed, halfdragtig en voldragtig te word, en verklaar dus die verhouding van 1:10 i.p.v. 1:9 soos in die huidige ondersoek gevind.

Ons besluit dus dat die berekende verhouding waar en eg is, omdat dit in twee verskillende muskietseisoene bevestig is, maar die geldigheid van die bevindings word nog verhoog as ons verder gaan:

(c) Vir die 48 ander rusplekke wat in deel B uiteengesit is, lewer die syfers ook weer die verhouding van 1 ongevoede teenoor 9 gevoedes en dragtiges. Hier het ons dus, in die huidige ondersoek, alleen reeds vir die derde keer die verhouding 1:9. Maar:

(d) In deel C vind ons egter vir die verskeidenheid van 30 verskillende rusplekke dat ongevoedes tot gevoedes en dragtiges in die verhouding staan van 1:8. Hierdie uitsondering is interessant want dit lewer die oplossing vir hierdie en die volgende verhouding:

(e) Vir die 18 dongas staan ongevoedes tot gevoedes en dragtiges in die verhouding van 1:10. Hierdie syfer word verklaar deur te wys dat die dongas by of langs *gambiae* se broeiplekke is, terwyl daar nie broeiplekke in hutte (met die verhouding 1:9) is nie: Dus verwag ons meer dragtige wyfies wat eiers kom lê in die dongas — vanwaar dan die verhouding 1:10. En:

(f) Vir die 30 verskillende rusplekke in deel C, waar 'n verhouding van 1:8 gevind is, is dit dus duidelik dat dongas met 'n verhouding van 1:10, en hutte met 'n verhouding van 1:9, gunstiger is vir *gambiae* wyfies as die 30 verskillende rusplekke. Bowendien:

(g) Dit is nog verder insiggewend om te herhaal dat die gemiddelde van die verhoudings 1:8 en 1:10, soos reeds vir die 48 ander rusplekke in deel B bereken, 1:9 is.

Ons besluit dus dat gedurende die huidige ondersoek die verhouding van ongevoede tot gevoede en dragtige wyfies, werklik 1:9 is.

#### Mannetjies

Wanneer ons nou die ander geslag ook in berekening bring, kry ons:

(a) Wat die verhouding van getal mannetjies tot wyfies

betref, is daar in Tabel I deurgaans ver minder mannetjies as wyfies; 1 mannetjie vir elke 2.7 tot 4.5 wyfies. Dit bevestig Bates se verklaring: 'All authors are in agreement that the life span of the males of a given species is much shorter than that of the females'.

(b) Vir al die rusplekke tesame is daar gemiddeld 1 mannetjie vir elke 3.1 wyfies. Hieruit blyk dat wyfies gemiddeld 3.1 keer so lank soos mannetjies lewe, en dat mannetjies 0.32 keer so lank soos wyfies leef.

(c) Die kleinste verhouding wat gevind is, is dié vir die 30 verskillende rusplekke, nl. 1:4.5. Hierdie ander rusplekke is dus die ongunstigste vir mannetjies.

(d) Die grootste verhouding van mannetjies tot wyfies is 1:2.7 en is in die onbespuite hutte gevind. Hierdie grootste verhouding is vir ons malaria-uitwissingsveldtog belangrik, want dit wys:

Eerstens. Dat die hutte gunstiger is vir mannetjies as die ander rusplekke, en selfs gunstiger as die dongas.

Tweedens. Dat die hutte in die Nylstroom-substreek te naby die broeiplekke is — vandaar die grootste verhouding van mannetjies. Dit is algemeen bekend dat daar gestreef word om hutte so ver van broeiplekke te hê dat daar glad nie, of byna nooit, mannetjies in gevind word nie. (In 'n volgende artikel sal ons aantoon dat een-derde van die wyfies wat in dongas gevind is, die hutte bereik. Ook dat die daaglikse natuurlike sterfte van wyfies 33½% is, vergeleke met 50% elke tweede dag soos deur 'n ander navorser bereken.)

Derdens. Dat dit selfs nou nuttig mag wees as hutte verder van *gambiae* se broeiplekke gebou word, om so-doende nog minder wyfies in die hutte te hê, en daardeur die malaria-vrye Bantoes nog verder te beskerm teen malaria-oordraging wat plaaslik kan voorkom wanneer besmette immigrante oor ons grense inkom. Dis ook belangrik want die doelstelling is byna dwarsdeur die wêreld om malariavektors sonder malaria te hê.

Vierdens. Aangesien ons in Suid-Afrika te doen het met die suidelikste distribusiegrens van sowel *gambiae* as malaria, is die bou van hutte verder van die broeiplekke relatief nuttiger as in meer noordelike gebiede.

(e) In die 18 dongas is daar 1 mannetjie vir elke 3.7 wyfies. Dit dui o.a. dat die dongas relatief ongunstiger vir die mannetjies is as die hutte waar die verhouding 1:2.7 is.

#### MALARIA-UITWISSING

Volgens Tabel I is daar vir die 6 maande, November 1958 - April 1959, in 130 onbespuite hutte slegs 48 *gambiae*

TABEL I. *Anopheles gambiae* IN RUSPLEKKE IN DIE NYLSTROOM-SUBSTREEK : NOVEMBER 1958 - APRIL 1959

| Aantal rusplekke                 | Mannetjies | Wyfies    |        |              |             |               | Totaal gevoedes en dragtiges | Verhouding van ongevoedes tot gevoedes en dragtiges | Verhouding van mannetjies tot wyfies |
|----------------------------------|------------|-----------|--------|--------------|-------------|---------------|------------------------------|---|--------------------------------------|
|                                  |            | On-gevoed | Gevoed | Half-dragtig | Vol-dragtig | Totaal wyfies |                              |   |                                      |
| A Totaal van 178 rusplekke .. .. | 28         | 9         | 41     | 21           | 17          | 88            | 79                           | 1 : 9   | 1 : 3.1                              |
| B { 130 hutte .. ..              | 18         | 5         | 28     | 7            | 8           | 48            | 43                           | 1 : 9   | 1 : 2.7                              |
| { 48 ander .. ..                 | 10         | 4         | 13     | 14           | 9           | 40            | 36                           | 1 : 9   | 1 : 4.0                              |
| C { 30 verskillende .. ..        | 4          | 2         | 5      | 6            | 5           | 18            | 16                           | 1 : 8   | 1 : 4.5                              |
| { 18 dongas .. ..                | 6          | 2         | 8      | 8            | 4           | 22            | 20                           | 1 : 10  | 1 : 3.7                              |



wyfies gevind; dus gemiddeld 0.37 *gambiae* per hut per ondersoek.

As ons nou verder in aanmerking neem dat daar gedurende die oorblywende 6 droë maande van die jaar, gemiddeld nog minder *gambiae*, of dikwels selfs geen *gambiae* in 'n hut in die Nylstroom-substreek gevind word nie, en dat plaaslike oordraging van malaria, behalwe soms 2 of 3 aangemelde gevalle per jaar, hier reeds afwesig is gedurende die afgelope 3 jaar (terwyl ons vroeëre oordrager van endemiese malaria, *Anopheles funestus* Giles, feitlik spoorloos verdwyn het), dan is dit duidelik dat malaria in hierdie substreek uitgewis is.

#### BESPREKING EN AANBEVELING

Omdat ons nie op één dag genoeg *gambiae* wyfies in Transvaal kon kry vir 'n statisties-geldige Busvine-Nash of 'n weerstandstoets van die Wêreldgesondheidsorganisasie, het ons 'n vereenvoudigde dragtigheidstegniek ontwerp vir opsporing van fisiologiese weerstand teen BHC.<sup>2,3</sup> Die grondslag van die tegniek is dat as *gambiae* fisiologiese weerstand teen BHC het, sy nog haar eiers in hutte sal rypmaak en dus as voldragtig in BHC-bespuite hutte sal voorkom.

Terwyl data deur middel van die vereenvoudigde tegniek ingesamel, reeds nuttige vrugte gelever het deur o.a. aan te toon dat BHC-hutbespuiting in die Transvaal 6 maande lank doeltreffend bly i.p.v. 3 maande, soos voorheen aanvaar is, het ons die huidige gegewens ingesamel om die betroubaarheid van hierdie tegniek verder na te vors.

In die huidige ondersoek is gevind dat die tegniek konsekwente data oplewer oor die ekologie of huishouding van *gambiae*, nie net gedurende die 1958-59 seisoen nie, maar ook gedurende die voorafgaande seisoen.

Die klein getalle van *gambiae* in Tabel I wys weer hoe onmoontlik dit is om op één dag genoeg wyfies vir Busvine-Nash of ander weerstandstoets in Transvaal te vang.

As ons nou weer die konsekwente bevindings in die voorgaande afdeling 3 opsommend oorweeg, en ten slotte na die 2 ongeoede wyfies uit die 18 dongas in Tabel I, deel C, kyk, dink mens onwillekeurig aan die spreekwoord: 'Truth is not always probable'. En dan lyk dit dat mnr. Vosloo se eksperimentele fout by die disseksie waarskynlik amper 0.0 is.

Ons gevolgtrekking is dus dat die vereenvoudigde dragtigheidstegniek, so ver ons kan sien, betroubaar is, en

nuttige gegewens lewer oor die gewoontes van *gambiae*, asook vir die opsporing van fisiologiese weerstand teen BHC; en dus vir malaria-uitwissingsveldtogte handig is.

Die tegniek word ook aanbeveel vir streke waarin malaria-uitwissing reeds so ver gevorder is dat hutbespuiting reeds beëindig is en opsporingseenhede slegs hutte met BHC bespuit waar menslike parasietdraers gevind word.<sup>5</sup>

#### SUMMARY

The rationale of our simplified gravidity technique for determining the presence of physiological resistance of *Anopheles gambiae* to BHC is that, if this vector is resistant to BHC, fully-gravid females will still be found indoors.<sup>2</sup>

During the present investigation resting places were check-sprayed with 'pyagra', and recovered specimens recorded as males, unfed, fed, half-gravid or fully-gravid females. Dissections revealed that the ratio of unfed to fed and gravid females was respectively 1:9; 1:9; 1:8, and 1:10 in a total of 178 resting places; 130 unsprayed huts, 48 resting places; 30 various resting places, and 18 dongas. These consistent ratios confirmed our former findings.<sup>4</sup> Females lived 3-1 times as long as males. The highest ratio of males to females was 1:2.7, and occurred in huts. It is considered that huts are situated too near the breeding places.

It is concluded that this technique yields reliable data and should be used in malaria eradication campaigns; as well as after virtual eradication when surveillance units spray huts with BHC only in areas yielding positive human parasite carriers.<sup>5</sup>

Graag bedank ons elkeen van die veldpersoneel wat verantwoordelik was vir die insameling van hierdie en vorige gegewens. Ons dank dr. J. J. du Pré le Roux, voormalige Sekretaris van Gesondheid, vir sy toestemming om hierdie gegewens te publiseer, sowel as dr. C. J. H. Brink, Hoofstreeks-gesondheids-beaampte, Pietersburg, Transvaal, en mnr. H. J. Combrink, Senior Gesondheidsinspekteur, Nylstroom, Transvaal, vir hulle vindingryke samewerking.

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## ACCIDENTAL PARAFFIN POISONING

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Accidental ingestion of paraffin is the commonest cause of chemical reaction in the lungs of infants and children.<sup>1</sup> Other substances, closely related chemically, which are sometimes accidentally ingested, are: petrol, lighter fuel, insect sprays, cleaning fluids, house paint, turpentine and furniture polish.<sup>2</sup> These products are frequently kept in containers familiar to children, such as milk and cold-drink bottles, cups, jam and condensed-milk tins, usually within easy reach of adventurous and probably hungry children. Paraffin is widely used among the non-White

population in South Africa for cooking, lighting and heating purposes, and is comparatively cheap.

Introduction of paraffin into the lungs produces rapid development of a pneumonitis, which may be visible on radiographs within 20 minutes of its introduction, and may persist for several weeks, even when symptoms and signs have disappeared.<sup>2</sup>

Two theories have been advanced for the development of pulmonary signs:

1. Aspiration into the bronchial tree, either at the time of ingestion or during vomiting.

2. Absorption through the gastro-intestinal tract into the circulation, vaporization by body heat and hence entry into the lungs.

This last theory (2) is not now held to be a factor in the development of the lung lesions and the first theory (1) is generally accepted.

Experimental work by Richardson and Pratt-Thomas in 1951,<sup>3</sup> showed that large quantities (calculated to be more than 1 pint in infants) would have to be ingested before death occurred. However, very small quantities (about 1 dram) introduced into the bronchial tree, could lead to severe oedema and haemorrhage, followed by cellular infiltration. Atelectatic changes usually occur, followed by bacterial invasion and consolidation.

The X-ray changes are non-specific and are said to occur in 75% of cases, whereas physical signs are abnormal in only 25%.<sup>4</sup> Typically, the radiographic changes are those of oedema, atelectasis and areas of consolidation. These changes may be segmental, on one or both sides, involving especially the lower lobes, or extending radially from the hila. Uncommonly, pleural effusions, pneumothorax, pneumomediastinum, pneumopericardium or subcutaneous emphysema may occur.<sup>4</sup>

Symptoms usually include coughing, choking and vomiting. Drowsiness frequently occurs and is said to be due to absorption of products closely allied to anaesthetic agents.

#### PRESENT SERIES

During the period January - December 1959, 61 patients, who had swallowed paraffin accidentally, presented themselves at the Livingstone Hospital Casualty Department, Port Elizabeth, which dealt with 31,268 cases during this same period, making an incidence of just under 0.2%. In comparison, there were in this same period 1 case of caustic-soda poisoning in a child who the previous year had accidentally swallowed paraffin, 1 case of benzene poisoning and 2 cases of children who accidentally swallowed sheep-dip.

Analysis of these 61 cases showed that there were 21 females and 40 males. Their ages varied from 9 months to 19 years, and, excluding a 19-year-old female whose story sounded suspiciously like an attempted suicide, their average age was 21 months.

#### Signs and Symptoms

Of the 61 patients, 2 were found to be suffering from coincident otitis media, 1 had pulmonary tuberculosis and 1 had a cellulitis of the left leg. These 4 have been excluded from this series. Of the remaining 57 cases, only one-third underwent X-ray examination when first seen, and 60% of these showed non-specific atelectatic and consolidating lesions, mostly in the lower lobes. The rest appeared normal. Those admitted to hospital improved rapidly and were discharged within 3-7 days. There were no fatalities.

Symptoms and signs met with in this group of 57 cases were: no symptoms and signs 23, pyrexia 17, vomiting 16, coughing 16, drowsiness 8, rhonchi 7, dyspnoea 6, crepitations 6, frothing at mouth 3, dullness at bases 1, pleural rub 1, and diarrhoea and colic 1 each.

It was not possible to estimate the amount of paraffin

ingested and thus correlate this factor with the radiographic findings and the severity of signs and symptoms.

#### Treatment

All the patients were treated initially in the casualty department and only 10 were admitted to the wards, these being the most severely ill. The rest were given antibiotics and chemotherapy, discharged, and told to return for follow-up at the out-patient department. Gastric lavage was not carried out and it is probably wiser not to do so unless the amount of paraffin ingested is very large, in view of the dangers of aspiration during this procedure. Similarly, induction of vomiting is probably also unwise.<sup>2</sup>

#### Follow-up

In order to test the efficacy of the treatment given, letters were written to the parents of these patients requesting them to bring their children back for follow-up examination and radiography. Five letters were returned marked 'address unknown'; 1 patient had died, 3 months after drinking the paraffin, from lobar pneumonia complicating measles, but had been fit and well up to her fatal illness; and 5 patients were considered to live too far away for them to make the journey and were excluded from the scheme. Therefore, of the original 57 patients, 46 remained, of whom 30 returned for follow-up.

On X-ray examination of these 30 cases, 2 cases of pulmonary tuberculosis were found which had developed 13 and 10 months respectively since the previous X-rays taken at the time of ingesting paraffin. The other 28 cases were reported to be fit and well and this was confirmed clinically and radiologically.

#### CONCLUSIONS

It would therefore appear that lasting effects from paraffin ingestion are unlikely to occur and that antibiotic and chemotherapeutic cover as soon as possible, without gastric lavage, constitutes adequate treatment in the great majority of cases.

Hospitalization and intravenous replacement of fluids, oxygen administration and stimulants would seem to be necessary only for those severely ill from pulmonary changes, dehydration as a result of vomiting, and drowsiness and coma as a result of absorption of toxic products.

#### SUMMARY

1. The findings in 61 cases of accidental paraffin ingestion over a period of 12 months are described.
2. An attempt at a clinical and radiological follow-up after 1 year is described.
3. The symptoms, signs and radiographic changes are indicated.
4. The treatment is briefly discussed.

Thanks are due to Dr. J. Ware, Medical Superintendent, Livingstone Hospital, for permission to publish; to Drs. I. Gordon and G. Comay for access to their case notes; and to Mrs. M. Rogers for secretarial work.

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## CRUDE FIBRE, BOWEL MOTILITY, AND PATTERN OF DIET

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It has been known for long that there is a relationship between crude-fibre intake, bulk-forming capacity of diet, and bowel motility. Whereas fibre intake and bulk-forming capacity have attracted attention only relatively recently, there is an extensive literature on the subject of adequacy of bowel movement, laxation, and constipation. Purging was often referred to in Biblical times. Down through the ages in the various pharmacopoeias and recipes for herbs and simples, there was no lack of remedies for the costive.

### Cereal Fibre in the Diet

Cereal-fibre intake was high in civilized communities until 3-4 generations ago. In Britain, before 1870-80, stone-ground wheat meal had little of the bran fraction removed from it. Bread made from this meal (often mixed with rye) was consumed in large amounts; a century ago the average daily consumption was about 21 oz. per person.<sup>1</sup> In addition, oatmeal porridge formed much of the diet of the poorer classes. Thus, a considerable amount of cereal fibre was ingested by the majority of the population. Since 1870-90, however, wheat has been ground in roller mills permitting the production of a bran-free white flour having a negligible fibre content. The bread made from it was eagerly welcomed by the general public, and in time almost entirely superseded the wholemeal bread. As prosperity increased and foods other than bread became more easily available, the amount of this foodstuff eaten per person slowly declined; whereas it was 16 oz. in 1902,<sup>2</sup> by 1945 it had decreased to about 11 oz.<sup>3</sup> Moreover, of the present low intake, only a small proportion is made from high extraction meal. In the United States, Riley<sup>4</sup> has related how 'the mass of the food of our fathers and grandfathers . . . was subjected to the simplest and most necessary processing only', and then referred to the changes in milling that took place when Benjamin Harrison was President. By 1942, of the total amount of cereal consumed, only 3% was of high extraction type.<sup>5</sup>

The progressive reduction in the consumption of bread was accompanied by great increases in the amounts of other foodstuffs eaten. Of these increases, perhaps the most outstanding has been that of sugar. In Britain, from 1835 to 1935 its consumption rose by about 500%;<sup>6</sup> similar rises occurred in other Western countries. Sugar, upon digestion, leaves no residue. Major increases in consumption also occurred with dairy produce, eggs, and meat;<sup>6</sup> these foods yield little residue after digestion. Very marked changes have taken place in the consumption of fruit and vegetables (other than potatoes).<sup>6</sup> Yet in bulk-forming capacity, experimental<sup>7</sup> and clinical observations<sup>8</sup> indicate that lightly milled bread easily ranks highest, followed by vegetables like cabbage and carrots, with fruit lowest in the list. Briefly, the change in cereal extraction rate, the fall in bread consumption, and the lesser effectiveness in laxation of the increased consumption of fruit and vegetables, together greatly reduced the bulk-forming capacity of the diet.

### Early Views on Constipation

How did this change affect bowel movement? There was no doubt among the authorities of the period of change that constipation was common, and would seem to have become increasingly so, although adequate information is lacking. By 1886 Cheadle,<sup>9</sup> a leading clinician, wrote that there was 'no disordered condition of the body which is so frequently the subject of medical treatment as constipation'. This was reiterated by Sir John Sawyer<sup>10</sup> in 1910, when he said that the treatment and cure of habitual constipation engage attention oftener than other details of remedial art. In the same year, Goodhart<sup>11</sup> affirmed 'that with advancing civilization aperients would always be with us', but lamented 'the change from the occasional pill of our forefathers to the excess of the present day'. There seems, moreover, to have been agreement over the primary cause of the increase in constipation. Cheadle,<sup>9</sup> for

example, listed the chief cause as consumption of 'food which leaves little residue; very completely digested food . . . faecal matter too small to duly excite peristalsis'. This view was reiterated in various ways by later observers. It is recognized, of course, that factors other than crude fibre are influential in laxation. Thus it is accepted that physical exercise, as against sedentariness, is beneficial for bowel movement.<sup>12</sup> In various discussions in the past (when the subject evoked much more attention than at present), the question was asked occasionally: whoever heard of a ploughman or of a labouring man being constipated?<sup>13</sup> Understandably, the urbanization accompanying the industrial age, the mechanization of farming, and other factors, certainly caused a decrease in the general activity of a large proportion of the population, and undoubtedly bears on the subject under review. Notwithstanding, there are reasonable grounds for considering that the prime factor influencing bowel motility, directly or indirectly, is the bulk-forming capacity of the diet. In this respect, it is of significance that during the last war, in countries which experienced dietetic changes which included an increase in crude-fibre intake, marked reductions in the incidence of constipation were reported, — in Britain,<sup>14</sup> Eire,<sup>15</sup> the Channel Islands,<sup>16</sup> Switzerland,<sup>17</sup> etc., — and the sale of aperients fell.

### Excessive Treatment of Constipation

Regarding the situation at present, it has been stated that 'in no function of the body of civilized man is there so much self-interference as in the elimination of faecal waste'.<sup>18</sup> The extent of the 'interference' must be enormous. In Britain, in a study of 1,352 National Health Insurance male workers, it was found that 61% purged themselves regularly with patent medicines, usually every weekend.<sup>19</sup> In another study, an examination of 1,100 Post Office employees revealed that almost a quarter were taking aperients twice a week or more often; there was an increase in the practice with age, reaching a maximum of 40% in the sixth decade.<sup>20</sup> It is not therefore to be wondered at that inadequacy of bowel movement or constipation has been called the 'bane of the British people',<sup>21</sup> and 'the national curse'.<sup>22</sup> Nor is the condition less common in the United States; an editorial<sup>23</sup> in the *Journal of the American Medical Association* once movingly referred to 'the imperative need that millions of persons feel for something that will assist in the regulation of the bowel'. As to the amounts and the cost of purgatives used, accurate figures are not available. But in Eire (3 million inhabitants) in 1941, data given by Saunders<sup>15</sup> indicated that the consumption of one purgative, Epsom salts, was approaching 300 tons per annum. If we extrapolate this consumption to the United States, then the amount ingested annually would approach 20,000 tons. In relation to costs, it was reported some years ago that over 100 million dollars were spent annually in the United States on laxatives; not included in this figure was the cost of proprietary cereal products frequently used for the same purpose and calculated to be in the neighbourhood of this sum.<sup>24</sup> Concerning propaganda, Thompson<sup>25</sup> stated that in Britain in 1941 about £300,000 were spent annually on advertising constipation cures; from the information given by him 2% of all newsprint advertisement space was thus occupied.

### Significance of Constipation

The question which now arises is, is it really of any significance to health whether stools are hard or soft, large or small, formed or formless, eliminated regularly or infrequently, with ease or with pain?

In the early days, clinicians had no doubt that constipation was deleterious. Sir Lauder Brunton<sup>26</sup> and many others discoursed expansively on the relevant toxæmias and other ill effects. From the turn of the century onwards, patients with 'intractable constipation' were subjected to 'multilating' opera-

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tions (severe at that time) whereby various lengths of the large gut were removed.<sup>27</sup> Sir William McEwen<sup>28</sup> in his Huxley lecture in 1910 sarcastically stated: 'There is at present openly expressed discontent about the alimentary tract. Some are persuaded that there is an intestinal whorl too much, and that this extra whorl requires to be short circuited'. As late as 1929, an Annotation<sup>29</sup> in the *Lancet* indicated that 'constipation is undoubtedly the cause of much ill-health'. About that time, however, largely due to the careful studies of able gastro-enterologists like Alvarez,<sup>30</sup> it was demonstrated that the direct ill effects of constipation are largely psychogenic, and that the 'well recognized train of symptoms: malaise, headache, hebetude, poor appetite, coated tongue and foul breath', associated with a loaded intestine, appear to be mainly of nervous origin.<sup>31</sup> At the other extreme, the Gilbertian situation is such that Lord Horder<sup>32</sup> drew attention rather to 'the harmful habit of swallowing purgative drugs'.

At present, therefore, the low intake of crude fibre associated with a measure of inadequacy of bowel movement, while common, is not apparently of direct importance to health; the condition is so readily relieved by 'something' from the chemist shop, that it is no longer a problem for the physician. The unimportance with which the subject is now regarded may be judged by the fact that the word 'constipation' is not even mentioned in the 66-page index of a recently published authoritative textbook on nutrition.<sup>33</sup>

#### Inferior Present-day Dietary Pattern

The more important aspect of the subject which should be investigated is whether the pattern of diet which, *inter alia*, includes a low or negligible intake of crude fibre, is broadly inferior to that pattern which includes a high intake. The diet of our forefathers was high in crude fibre and bulk-forming capacity; but it was possibly low in energy value, and certainly low in animal protein, sugar and fat.<sup>34,35</sup> This is still the pattern of diet consumed by the majority of the world's population (in Africa and Asia). Unfortunately, the variety of adverse environmental factors which affected populations in the past, and also affect less privileged populations today, militates against a precise assessment of the value of the pattern of diet described. Of great significance to the problem at issue is the fact that in wartime that pattern, in some measure, is often involuntarily imposed on civilized populations. The results of certain of these long-term changes in regimen are illuminating. In Britain, after the last war, it was stated that there has been a striking decrease in deaths of infants under 1 month, a great reduction in deaths due to inflammation of the gallbladder, a great reduction in deaths due to exophthalmic goitre, a reduction in diabetes mellitus, an enormous improvement in the death rate of children aged 5, and a substantial decrease in mortality associated with pregnancy. There was evidence of a diminished amount of anaemia.<sup>36</sup> While certainly there were changes other than diet which occurred simultaneously in the manner of life of the British people, it seems likely that the change in diet was the principal influencing factor. In Switzerland, much the same changes in diet and subsequent observations were made. Arising therefrom Fleisch<sup>37</sup> maintained that 'the large amounts of calories, proteins, and fat formerly considered as the optimum and which were eaten in such civilized countries as the United States, England and Switzerland, are surely no necessity. They probably do not represent the optimum for health and capacity . . . A large part of the meat and eggs eaten before the war, and a large part of the refined food such as cooking-fat, sugar, white bread, macaroni, etc., can be advantageously replaced for health by potatoes, vegetables, fruit and darker bread. Today the world is imbued with the spirit that an agreeable taste goes hand in hand with biological value. The food of peace-time which was concentrated, strongly refined, rich in protein and fat, flatters the palate, but it is not the optimum for the organism'.

How many of the beneficial changes described could have been due to increased intake of crude fibre, with consequent effect on bulk-forming capacity and bowel motility? It is well-nigh impossible to differentiate between the metabolic ramifications of this factor, and the ramifications of the

total associated pattern of diet. There is some evidence, however, that addition of crude fibre to the diet of small animals has a promotive effect on general health, including fertility and longevity.<sup>38</sup> Surely we ought to know much more about the question whether crude fibre is or is not of importance in human nutrition, especially among contrasting populations. For instance, the South African Bantu has a higher rate of bowel motility, larger stools and greater frequency of defaecation than the European. Have these any bearing on health or disease patterns and are they connected with the amount of crude fibre in the diet?

#### Conclusions

The conclusions reached from the above wartime observations have been apparent to authorities in other periods. Charles Mayo<sup>37</sup> was not happy about the changing pattern of disease accompanying modern changes in diet. Cathcart<sup>38</sup> persistently maintained that it was possible to be well and to keep well on the simplest of diets. It has been averred by Wilder<sup>39</sup> that the need for better nutrition arises largely from the use of processed foods, especially white bread and refined sugar.

Assuming that these observations are true and their interpretation valid, then it is inescapable that there is much to be learnt from that pattern of diet of which a high intake of crude fibre is a feature. One implication is that the philosophy of producing 'bigger and better' by the reiteration of 'drink more milk', 'eat more fish', and similar popular slogans, requires re-examination. It will, of course, be argued by many that, while the importance of the observation cited is indisputable, the likelihood of peace-time populations changing from a palatable diet to one of less palatability is so remote as not to merit serious consideration. This view is open to argument. But irrespective of differences of opinion, there is a need, indeed, a duty, for writers of present-day textbooks on nutrition to devote a portion of their space to the nutritional lessons to be learnt from the past, from wartime experiences, and from present-day backward populations.

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# OFFICIAL ANNOUNCEMENTS : AMPTELIKE AANKONDIGINGS

## THE MEDICAL ASSOCIATION OF SOUTH AFRICA CIRCULAR TO MEMBERS

### and NOTICE OF AN EXTRAORDINARY GENERAL MEETING

Notice is hereby given that an Extraordinary General Meeting of members of the Medical Association of South Africa will be held at Medical House, 5 Esselen Street, Johannesburg, on the eighth day of March 1961, at 10 a.m., 'with a view to implementing the Medical Services Plan in all provinces of South Africa'.

The meeting is called in terms of the Constitution on a requisition signed by over 100 members of the Association.

Members are advised that travelling expenses and subsistence allowances are not payable for attending a General Meeting of the Association.

At a General Meeting no business shall be transacted unless there be present not less than 50 members in person or by proxy.

For the information of members sub-sections (d) and (e) of By-law 32 are quoted below:

'(d) Every proxy shall be as nearly as material in the following form:

Medical Association of South Africa.

I, A.B., being a Member of the abovementioned Association, hereby appoint C.D. of ..... of whom failing E.F. of ..... also a Member of the said Association as my proxy to appear and vote for me upon all matters to be brought forward at the General Meeting of the Association to be held on the ..... day of ..... 1961, at ..... and at any adjournment thereof.

In witness whereof I have set my hand hereto at ..... on this the ..... day of ..... 1961.

Signature of Grantor.

(Note—The name of the proxy or proxies must be inserted in the blank left for the purpose in the handwriting of the Grantor himself, and he must affix thereto and cancel a penny and a halfpenny (1½d.) or a one cent (1c.) postage or revenue stamp.)

'(e) Proxies shall be delivered to the Secretary prior to the hour fixed for the Meeting at which the same are intended to be acted upon.'

L. M. Marchand  
Associate Secretary

28 Plaza Building  
Pretoria  
1 February 1961

## SOUTH AFRICAN MUTUAL MEDICAL AID SOCIETY

It is with regret that members of the Association are informed that negotiations with the South African Mutual Medical Aid Society have broken down, as a result of which approval cannot be granted to the Society. This means that *all persons insured by the Society*, including the groups already approved (p. 1064 of the *Journal* for 10 December 1960), must now be treated as private patients to whom accounts should be rendered direct and who should personally be responsible for the payment of their accounts.

Cheques forwarded to practitioners by the South African Mutual Medical Aid Society for a sum less than that of the account rendered to the patient should be returned to the Insurance Company or the patient forthwith.

Some confusion appears to have arisen in this matter because it has been brought to our notice that medical practitioners have refused to accept payment from other medical aid societies 'because approval had been withdrawn from them'. This is incorrect since approval has not been withdrawn from the other medical aid societies, but only from the groups administered by the South African Mutual Medical Aid Society whose names were published in the *Journal* for 10 December 1960.

L. M. Marchand  
Associate Secretary

28 Plaza Building  
Pretoria  
3 February 1961

## MEDIESE VERENIGING VAN SUID-AFRIKA OMSENBRIEF AAN LEDE

### en KENNISGEWING VAN 'N BUITENGEWONE ALGEMENE VERGADERING

Kennis geskied hiermee dat 'n Buitengewone Algemene Vergadering van die Mediese Vereniging van Suid-Afrika gehou sal word op die agste dag van Maart 1961 om 10 vm, te Mediese Huis, Esselenstraat, Johannesburg, 'with a view to implementing the Medical Services Plan in all provinces of South Africa'.

Die vergadering word ingevolge die Konstitusie op 'n versoek wat deur meer as 100 lede van die Vereniging geteken is belê.

Lede word daaraan herinner dat hulle nie geregtig is op vervoer- en onderhoudstoelae vir bywoning van 'n Algemene Vergadering nie.

Geen sake mag op enige algemene vergadering afgehandel word nie tensy daar 'n kworum van minstens vyftig lede persoonlik of deur volmag teenwoordig is.

Vir die inligting van lede word sub-artikels (d) en (e) van Verordening 32 hieronder aangehaal:

.(d) Elke volmag moet nagenoeg in die volgende vorm wees: Mediese Vereniging van Suid-Afrika.

Ek, A.B., synde 'n lid van die bogenoemde Vereniging, gee aan C.D. van ..... of anders E.F. van ..... ook 'n lid van die voormelde Vereniging, volmag om namens my te verskyn en te stem oor alle sake wat voorgebring mag word op die algemene vergadering van die Vereniging wat gehou sal word op die ..... dag van ..... 1961, te ..... en op enige verdagging daarvan.

Ten bewyse waarvan onder my hand gegee te ..... op hierdie die ..... dag van ..... 1961.

Handtekening van Gewer.

(Opmerking—Die naam of name van die gevolmagtigde of gevolmagtigdes moet in die handskrif van die gewer van die volmag self ingevul word in die oop spasie wat daarvoor gelaat is, en hy moet 'n pennie en 'n halfpennie (1½d.) of 'n eensent-possel (1c.) daaraan heg en kanselleer.)

.(e) Volmagte moet by die sekretaris ingelewer word voor die tyd wat bepaal is vir die vergadering waarop dit die bedoeling is om daarvan gebruik te maak.'

L. M. Marchand  
Medesekretaris

Plaza-gebou 28  
Pretoria  
1 Februarie 1961

## SUID-AFRIKAANSE ONDERLINGE MEDIESE HULPVERENIGING

Dit is met spyt dat aangekondig moet word dat onderhandelinge met die Suid-Afrikaanse Onderlinge Mediese Hulpvereniging afgebreek is, as gevolg waarvan dié Hulpvereniging nie goedgekeur kan word nie. Dit beteken dat *alle persone wat deur die Hulpvereniging verseker is*, insluitende die groepe wat reeds goedgekeur is (p. 1064 van die *Tydskrif* van 10 Desember 1960) nou as private pasiënte behandel moet word aan wie rekenings direk gestuur moet word en wat persoonlik vir betaling van hul rekenings verantwoordelik is.

Tjeks wat deur die Suid-Afrikaanse Onderlinge Mediese Hulpvereniging aan geneeshere gestuur word, wat uitgemaak is vir 'n bedrag minder as die bedrag van die rekening wat aan die pasiënt gelewer is, moet sonder meer aan die Hulpvereniging of aan die pasiënt teruggestuur word.

Dit kom voor dat daar verwarring ontstaan het in hierdie verband want dit is onder ons aandag gebring dat geneeshere geweer het om betaling van ander mediese hulpverenigings te ontvang aangesien goedkeuring van hul terugtrek is. Dit is nie die geval nie. Goedkeuring is nie van die ander mediese hulpverenigings teruggetrek nie maar slegs van dié groepe wat onder beheer van die Suid-Afrikaanse Onderlinge Mediese Hulpvereniging staan, die name waarvan in die *Tydskrif* van 10 Desember 1960 verskyn het.

L. M. Marchand  
Medesekretaris

Plaza-gebou 28  
Pretoria  
3 Februarie 1961

# UROLOGICAL ASSOCIATION OF SOUTH AFRICA (M.A.S.A.), THIRD CONGRESS, JOHANNESBURG, 27 FEBRUARY - 2 MARCH 1961

The Third Congress of the Urological Association of South Africa (M.A.S.A.), will be held at Medical House, Esselen Street, Johannesburg, from 27 February to 2 March 1961. The Urological Association has invited all interested doctors to attend this Congress.

Four distinguished visitors from overseas will address the Congress. They are: Prof. Leslie N. Pyrah, Professor of

Urological Surgery, Leeds University; Prof. Jean Cibert, Professor of Urology, Lyons, France; Mr. D. F. Ellison Nash, Dean of St. Bartholomew's Hospital Medical School, London; and Prof. A. de la Pena, Professor of Urology, University of Madrid, Spain.

A provisional programme is published below for the information of members:

## PROVISIONAL PROGRAMME

### Monday, 27 February

- 8.30 - 9.00 a.m. General and business meeting. First plenary session—Chairman: Mr. H. Currie Brayshaw.
- 9.00 - 9.30 a.m. Opening of Congress by Mr. H. Currie Brayshaw, Chairman of the Urological Association and Prof. D. J. du Plessis Professor of Surgery, University of the Witwatersrand, or the Dean of the Faculty of Medicine, University of the Witwatersrand.
- 9.30 - 10.10 a.m. 'The use of ileum in urological procedures'—Prof. L. N. Pyrah.
- 10.10 - 10.50 a.m. 'Results of the use of intestinal grafts in urology'—Prof. J. Cibert.
- 10.50 - 11.00 a.m. Tea interval.
- 11.00 - 11.30 a.m. 'The ileal loop, its tricks and troubles as applied to paraplegic incontinence'—Mr. D. F. Ellison Nash.
- 11.30 - 12 noon 'Transvaginal uretero-lithotomy'—Prof. A. de la Pena.
- 12.30 - 2.30 p.m. Luncheon, Country Club, Killarney. Afternoon session—Chairman: Mr. J. C. Jordaan.
- 3.00 - 3.40 p.m. 'Some aspects of urinary incontinence'—Mr. J. A. Currie.
- 3.40 - 4.30 p.m. 'A new technique of urethroplasty'—Mr. L. Jordaan.
- 4.20 - 4.30 p.m. Tea interval.
- 4.30 - 5.10 p.m. 'Results of urethroplasty'—Mr. G. C. Thomson.
- 5.10 - 5.50 p.m. 'Results of conservative management of bladder tumours'—Mr. S. J. Hoffmann and Dr. M. Shapiro.

### Tuesday, 28 February

- Morning session—Chairman: Prof. D. J. du Plessis.
- 9.00 - 9.40 a.m. 'The waterways of Africa'—Prof. G. Elliott.
- 9.40 - 10.20 a.m. 'Uretero-ileostomy vs. colo-cystoplasty'—Mr. J. C. Jordaan.
- 10.20 - 11.00 a.m. 'Bilharziasis'—Mr. C. D. Kisner.
- 11.00 - 11.20 a.m. Tea interval.
- 11.20 - 12 noon 'Diversion of urine in Africans'—Mr. P. J. P. Denchev.
- 12.30 - 2.30 p.m. Luncheon, Country Club, Killarney.
- 3.00 - 3.40 p.m. 'Renal angiography in the study of hypertension'—Dr. M. B. Denny and Dr. C. H. van Hasselt.
- 3.40 - 4.20 p.m. Presentation of cases of hypertension—Mr. E. Abro.
- Aortographic features in interesting cases—Mr. R. P. Schach.
- 4.20 - 4.30 p.m. Tea interval.

- 4.30 - 5.00 p.m. 'Present trends in the study of renal function in hypertension'—Drs. B. Goldberg and N. Levin.
- 5.00 - 5.30 p.m. 'Puberty—the forgotten age'—Dr. S. Lopis.
- Evening session: Special General Meeting of the Southern Transvaal Branch (M.A.S.A.)
- 8.15 - 9.00 p.m. 'Uropathology in the spinal disorders of childhood'—Mr. D. F. Ellison Nash.
- 9.00 - 9.20 p.m. 'Percutaneous puncture in polycystic kidney'—Prof. A. de la Pena.
- 9.20 - 9.30 p.m. Tea interval.
- 9.30 - 10.00 p.m. 'Treatment of hydronephrosis by ileal graft'—Prof. J. Cibert(?)
- 10.00 - 10.30 p.m. 'Parathyroid tumours in renal stone' and film on parathyroidectomy—Prof. L. Pyrah.

### Wednesday, 1 March

- 8.00 - 12.00 noon Operations.
- 12.00 - 1.00 p.m. General meeting, Urological Group.
- 1.00 - 2.30 p.m. Luncheon.
- 3.00 - 3.30 p.m. 'Coxianal prostatectomy'—Prof. A. de la Pena.
- 3.30 - 4.10 p.m. 'Technique of ileocystoplasty'—Prof. J. Cibert.
- 4.10 - 4.20 p.m. Tea interval.
- 4.20 - 5.00 p.m. 'Some congenital anomalies of the urinary tract'—Mr. D. F. Ellison Nash.

### Thursday, 2 March

- Morning session—Chairman: Mr. R. M. Honey.
- 9.00 - 9.40 a.m. 'The recto-sigmoid bladder'—Prof. L. Pyrah.
- 9.40 - 10.10 a.m. 'Urethral plication in male incontinence'—Mr. D. F. Ellison Nash.
- 10.10 - 10.50 a.m. 'Ileo-urethro-cystoplasty in repair of ruptures of the urethra' and 'Recto-cystoplasty for extrophy of the bladder'—Prof. A. de la Pena.
- 10.50 - 11.00 a.m. Tea interval.
- 11.00 - 12 noon Short cases.
- 12.30 - 2.30 p.m. Luncheon, Country Club, Killarney.
- Afternoon Session—Chairman: Chairman of the Pharmaceutical Association.
- 3.00 - 4.00 p.m. Short cases and interesting films.
- 4.00 - 6.00 p.m. Films: (1) Boari procedure for ureteral reconstruction, SKF, (2) film on Far East by Mr. R. C. Campbell Regg, and (3) Cinefluoroscopy of bladder dysfunction, Dr. C. Komins.
- 'Stag' dinner.

### Friday 3 March

Departure for Game Reserve, returning Sunday afternoon.



### 43RD MEDICAL CONGRESS (M.A.S.A.), CAPE TOWN, 24-30 SEPTEMBER 1961 : 43STE MEDIESE KONGRES (M.V.S.A.), KAAPSTAD, 24-30 SEPTEMBER 1961

#### COMBINED SECTIONAL MEETINGS

Three main combined sectional meetings will be held during Congress. Subjects for these meetings are as follows:

1. Respiratory failure
2. Antibiotics, chemotherapy and cross-infection
3. Diagnosis and treatment (medical and surgical) of occlusive arterial disease.

Doctors who intend contributing to the combined sectional

meetings are requested to submit *summaries* of their papers to the Secretary, Scientific Committee, 43rd South African Medical Congress, P.O. Box 643, Cape Town, not later than 30 April 1961.

P.O. Box 643  
Cape Town  
1 February 1961

G. S. Muller Botha  
Secretary, Scientific Committee

#### SCIENTIFIC EXHIBITIONS

A circular letter from the Chairman of the Scientific Exhibition Sub-Committee is reproduced below for the information of members of the Association:

'It is the intention of the Organizing Committee to arrange a scientific exhibition in conjunction with the proceedings of Congress. We feel that this will offer a unique opportunity for the demonstration of scientific research and other work presently being carried out in the Union, not only by official bodies and sponsored research units and groups, but also by individual doctors and scientists.

'The approach to this exhibition will be as broad as possible and will include anthropology and genetics, psychology and industrial aptitude testing, public health and sanitation, the medical applications of atomic energy, nutrition, food technology and quality control, therapeutic substances, production and control, health education and immunization procedures, veterinary work and the zoonoses, hospital planning and medical services administration, the history of medicine and its instruments, tribal medicine and customs, as well as the full field of medical research. General practitioners are included.

'One part of the exhibition will be a cinematograph theatre showing a daily programme of medical and scientific films,

coloured slides, etc. It is hoped that closed-circuit television will be included.

'This preliminary circular is being sent to as many organizations and individuals as possible who may care to take part in the exhibition. To assist the planning committee, it would be appreciated if prospective exhibitors would indicate, as soon as possible, whether or not they or their organizations would be prepared to exhibit, and if so briefly indicate:

1. The nature and title of the exhibit.
2. Whether it will be (a) static display, (b) working demonstration, or (c) ciné or slide projection.
3. Approximately what (a) linear, or (b) square footage of display space will be required.
4. Whether power, water, drainage, or gas will be required.
5. If films or slides are to be shown, the approximate time taken.

'After this information has been received, preliminary plans will be drawn up and a subsequent circular will deal with the detailed plans, arrangements for demonstrators, delivery and erection, insurance, etc.

Medical House  
35 Wale Street  
Cape Town

H. O. Hofmeyr  
Chairman, Scientific Exhibition  
Sub-Committee

#### PASSING EVENTS : IN DIE VERBYGAAN

*Research Forum, University of Cape Town.* The next meeting of Research Forum will be held on Thursday 16 February at 4 p.m. in the Tutorial Room of the Pathology Department, Medical School, Observatory, Cape. Dr. H. Lackner will present a paper, prepared in collaboration with Dr. R. Sougin Mibashan, on 'Fibrinolysis during lipaemia in the White and Bantu'.

In future, during the academic year, Clinico-pathological Conferences and/or Research Forums will be held in the Tutorial Room of the Pathology Department, Medical School, every Thursday at 4 p.m., followed by Staff Clinical Conferences in the Falconer Lecture Theatre, E-floor, Groote Schuur Hospital, Observatory, Cape, at 5.15 p.m. All general practitioners and others who may be interested are invited to attend these meetings.

Dr. S. B. Shochet, of Wynberg, Cape, has disposed of his practice and left the Union on 6 February with his family to settle in Israel.

*University of Cape Town and Association of Surgeons of South Africa (M.A.S.A.), Joint Lectures.* The next lecture in this series will be held on Wednesday 15 February at 5.30 p.m. in the E-floor Lecture Theatre, Groote Schuur Hospital, Observatory, Cape. Prof. J. H. Louw will speak on 'Obstructive jaundice in the newborn'. All members of the Medical Association are welcome to attend this lecture.

*South African Institute for Medical Research, Johannesburg, Staff Scientific Meeting.* The next meeting will be held on Monday, 20 February at 5.10 p.m. in the Institute Lecture Theatre. Dr. F. Zumpt will speak on 'Problems on the epidemiology of relapsing fever in Africa'.

*Lede word daaraan* herinner dat hulle die Sekretaris van die Mediese Vereniging van Suid-Afrika, Posbus 643, Kaapstad, sowel as die Registrateur van die Suid-Afrikaanse Geneeskundige en Tandheelkundige Raad, Posbus 205, Pretoria, moet verwittig van enige adresverandering. Versuim hiervan beteken dat die *Tydskrif* nie afgelewer kan word nie. Dit het betrekking op lede wat oorsig gaan sowel as dié wat binne die Unie van adres verander.

*South African Paediatric Association (M.A.S.A.), Cape Town Sub-Group.* The next meeting of this Sub-Group will be held on Tuesday 21 February at 8.15 p.m. in the Lecture Theatre, Red Cross War Memorial Children's Hospital, Rondebosch, Cape. Dr. A. Meyer will speak on 'Artifacts in paediatric radiography'. Visitors are welcome to attend this meeting.

*Eli Lilly Medical Research Fellowship (South Africa).* (Established by the Cape Town Postgraduate Medical Association.)

1. Applications are invited from suitably qualified medical practitioners for the Eli Lilly Medical Research Fellowship (South Africa).

2. The Fellowship is for the purpose of medical research and is not intended for postgraduate clinical study. It is available for 1 year.

3. The value of the fellowship is 3,600 United States dollars for 1 year and, in addition, travelling expenses will be allowed, based on a travel budget to be submitted by the Fellow. This will cover the cost of travel and incidental expenses from the place of residence of the Fellow to the approved place of study in the United States of America, as well as the return journey.

4. Other things being equal, preference will be given to candidates under 40 years of age.

5. Any medical practitioner registered in South Africa will be eligible for this award.

6. There will be no discrimination for the award on grounds of race, colour, creed, or sex.

7. The candidate must submit evidence of his capacity to do original research work.

8. The candidate must submit a programme of the proposed research. He is advised to submit an alternative scheme in case of difficulties about the first one.

9. It is advisable for the candidate to indicate at what institution he proposes to undertake the research and he should also state whether he is in a position to make any arrangements to carry out the research at the proposed institution.

10. The successful candidate must undertake to return to South Africa for a period of at least 2 years after the termination of the award.

11. The Selection Committee consists of: Dr. H. Brown, Cape Town; Prof. F. Forman, Cape Town; Prof. I. Gordon, Durban; Dr. A. Landau, Cape Town; Dr. D. P. Marais, Cape Town; Prof. S. F. Oosthuizen, Pretoria; Mr. G. Sacks, Cape Town; Dr. G. Selzer, Honorary Secretary, Cape Town; and Dr. H. A. Shapiro, Honorary Chairman, Johannesburg.

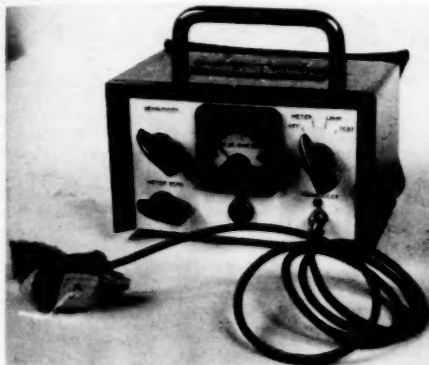
12. Applications must be forwarded to: Dr. H. A. Shapiro, (Honorary Chairman), Selection Committee, Eli Lilly Medical Research Fellowship (South Africa), P.O. Box 1010, Johannesburg. They must reach him not later than 1 May 1961. They should be concise, and accompanied by the names of not more than 2 suitable referees. Testimonials must not be included.

## NEW PREPARATIONS AND APPLIANCES : NUWE PREPARATE EN TOESTELLE

### PULSE-O-METER

Westdene Products (Pty.) Ltd. announce the introduction of the Pulse-O-Meter, manufactured by E. J. Middleton (Electronics) (Pty.) Ltd. of Johannesburg, and supply the following information:

The Pulse-O-Meter has been developed to aid an anaesthetist by providing him with a continuous indication of pulse rate during operations. Two types of transducers can be supplied,



one for application to the thumb and the other for direct application to a convenient artery.

Indication of pulse rate is given on a meter and provision has been made for a lamp, so that the unit can be used for cardiac catheterization when the patient is being X-rayed.

The complete unit is self-contained and operates from an internal battery. Battery test facilities have been incorporated so that the condition of the battery can be checked. It is housed in an attractive metal box with a suitable pouch for holding the transducer.

Further information may be obtained from Westdene Products (Pty.) Ltd., P.O. Box 7710, Johannesburg.

### YOMESAN

FBA Pharmaceuticals (S.A.) (Pty.) Ltd. announce the introduction of Yomesan, a new product for the removal of tapeworms, and supply the following information:

Treatment for tapeworms has so far remained a problem, since effective drugs often show a high toxicity and unpleasant and dangerous side-effects and require complicated preparatory measures and means of administration. Yomesan, developed in the research laboratories of Farbenfabriken Bayer AG, Leverkusen, is a completely new and effective cesticide, simple in use and well tolerated.

**Composition.** Yomesan contains N-chloro-nitrophenyl-chlor-salicylamide as the active principle and is supplied in vanilla-flavoured tablets of 0.5 g.

**Indications.** Yomesan is recommended for all kinds of tapeworms, in particular *Taenia saginata*, *Taenia solium*,

*Diphyllobothrium latum* and *Hymenolepis nana*. It is ineffective against other types of parasites. As it is not re-absorbed from the intestinal tract it will show no effect in the extra-intestinal tapeworm manifestations, cysticercosis and echinococcosis.

### Dosage and Administration

The evening before treatment only fluids should be taken. In the morning, on an empty stomach, half the dose of tablets is taken, followed 1 hour later by the second half of the dose. Two hours after the last dose food is permitted. The tablets may be swallowed whole, chewed, or dissolved in water.

Administration of a purgative is not necessary. If a rapid expulsion of the dead tapeworm in recognizable form is desired, a drastic purgative should be given 2 hours after the last dose of tablets, i.e. before breakfast.

Adults and children over 8 years: 2 tablets in the morning, 2 tablets 1 hour later.

Children 2-8 years: 1 tablet in the morning, 1 tablet one hour later.

Children under 2 years:  $\frac{1}{2}$  tablet in the morning,  $\frac{1}{2}$  tablet 1 hour later.

**Side-effects.** Yomesan is extremely well tolerated. No side-effects have been observed. Even during pregnancy and in patients with liver cirrhosis or rectal carcinoma Yomesan can be used safely.

**Packing.** Yomesan is available in boxes of 4 tablets.

Further information may be obtained from FBA Pharmaceutical (S.A.) (Pty.) Ltd., P.O. Box 10233, Johannesburg.

### MEDROL MEDULES

Upjohn announce the introduction of Medrol Medules, the first long-acting oral corticosteroid, and supply the following information:

Medrol Medules are presented in capsule form. A capsule consists of many tiny pellets of methylprednisolone, each covered with a special protective coating. The protective coating, developed in the Research Laboratories of the Upjohn Company, prevents dissolution of the pellets at the acidity of the normal stomach, but permits disintegration at the pH of the small intestine. Most of the Medules remain in the stomach for several hours, a few passing at a fairly constant rate into the small intestine where they soon disintegrate. The result of this gradual release of steroid in the small intestine is to produce a prompt and sustained steroid effect. The plasma level does not fluctuate considerably over a period of 12 hours.

Clinical experience has demonstrated the desirability of this long-acting oral adrenal steroid for 3 reasons: (1) Satisfactory control of the disease on a smaller daily dose of steroids; (2) less frequent and less severe side-effects, probably because of the absence of free adrenal steroid in the stomach and the absence of excessively high, peak blood levels; and (3) more sustained relief of symptoms.

Medrol Medules are available in vials of 30 4-mg. capsules.

Further information may be obtained from Tuco (Pty.) Ltd., P.O. Box 7779, Johannesburg.

## BOOK REVIEW : BOEKBESPREKING

## ENCYCLOPAEDIA OF SYNDROMES

*Encyclopedia of Medical Syndromes.* By Robert H. Durham, M.D., F.A.C.P. Pp. 628 + xiv. \$13.50. New York: Paul B. Hoeber, Inc. 1960.

Here is an unusual and, indeed, a unique book which has in its pages detailed descriptions of nearly a thousand syndromes covering the whole ground of the practice of medicine. It is obvious that this is the result of years of work on the part of the author, for each syndrome is marshalled with the

essential facts, incidence and sex ratios, congenital factors, aetiology, clinical manifestations, pertinent laboratory and pathological findings, clinical course, recommended treatment, and prognosis.

The arrangement makes for the easy reference which one expects of an 'encyclopaedia'. Basically this is alphabetical, but there are cross-references by synonyms. The excellent index is arranged by classifications by systems.

As a reference book it is recommended.

A.H.T.

## CORRESPONDENCE : BRIEWERUBRIEK

## A CASE OF SNAKE-BITE

*To the Editor:* An Indian boy, aged 16 years, was seen in hospital 1 hour after he had been bitten below the left medial malleolus by an unidentified snake at 2.30 p.m. on 29 December 1960. He was given 10 c.c. of antivenene, 5 c.c. subcutaneously and 5 c.c. intramuscularly. After being observed for several hours he appeared well so he was allowed to go home.

Shortly after he arrived home he vomited several times, said that he had difficulty in breathing, and felt dizzy. He was brought back to hospital, where he immediately had a convulsion and stopped breathing.

He was intubated and ventilated with oxygen by the manual compression of an anaesthetic bag. His intercostal muscles were paralysed, there were small inadequate excursions of the diaphragm and it was necessary to continue artificial respiration throughout the night. He had several more convulsions and his blood pressure fell to unrecordable levels, requiring a 'levophed' intravenous infusion.

In the morning he was placed on a Radcliffe intermittent-positive-pressure respirator. He appeared deeply unconscious; paralysis was complete. The muscles of his arms and legs were fasciculating in rather a similar manner to that seen immediately after the intravenous injection of the depolarizing relaxant succinylcholine. There were no eye movements, no reaction to light or accommodation; the pupils were not dilated. The left ankle was moderately swollen and fang marks were later identified.

The patient was maintained on the respirator for a period of 5 days. Muscular movements started to return on the 3rd day (4 days after the bite). Progressive recovery took place and he was able to breathe on his own on the 5th day. As soon as he was able to move his head and eyes he was able to indicate that he understood the spoken word. During his recovery he was cheerful and acted in a normal manner. A neurological examination on the 14th day revealed no abnormality in the motor or sensory nervous system and he was discharged 15 days after the bite.

## Comments

Elapine snakes (e.g. mamba, cobra) are known to have venom which contains neurotoxins which may affect the cells of the central nervous system and/or the muscles themselves and so produce paralysis. It is of interest to know that in this case the effects of the neurotoxin were completely reversible. Such is also the case with the neurotoxin of tetanus. If the patient survives, the neurotoxin causes no permanent neurological damage.

The amount of antivenene given was small and probably inadequate, but this case does illustrate the value of the intermittent-positive-pressure ventilator in the treatment of respiratory failure. Since pharyngeal paralysis was present difficulties in treatment could be anticipated if a tank respirator had been used. Tank respirators may also prove ineffective when treating cases where gross obesity, late pregnancy or crush injuries to the chest exist.

I should like to thank Dr. Alan B. Taylor, Medical Superintendent, McCord Zulu Hospital, for permission to publish the case and the medical student, Mr. Chetty, who 'specialised' the case throughout the first night.

Beric Jackson

22 Myro Drive  
Durban  
21 January 1961

## MOONFLOWER POISONING

*To the Editor:* I was extremely interested to see, in the issue of the *Journal* for 31 December 1960, a report of moonflower poisoning by Drs. Griffiths and Smith,<sup>1</sup> the first reported in the literature.

About 18 months ago I saw a case of moonflower poisoning in a girl aged 19 months. I was asked to see this child urgently since the doctor in charge of the case stated that she appeared suddenly to have become completely maniacal and to be blind.

When I arrived at her home, the child was screaming in a maniacal fashion, her whole body was extremely red, her pupils were dilated, and her mouth and eyes were dry. A diagnosis of belladonna poisoning was made and the child was admitted to hospital. She recovered completely within 2-3 days.

A search was instituted in the garden of her home to try to find the cause of the poisoning. No stinkblaar (*Datura stramonium*) plants were found in the neighbourhood or in her parents' own garden; but her nurse stated that she noticed that the child had actually eaten some leaves off a plant in the garden. This plant turned out to be the moonflower and the Department of Botany of the University of Natal, Pietermaritzburg, confirmed that its leaves contained a large quantity of belladonna alkaloids.

I did not know that no similar case had been described in the past, and was therefore most interested to read Dr. Griffiths' report.

F. C. Friedlander

9-10 Braemar House  
158 Longmarket Street  
Pietermaritzburg  
23 January 1961

1. Griffiths, J. and Smith, D. P. G. (1960): *S. Afr. Med. J.*, **34**, 1114.

COPY OF A LETTER FROM DR. W. J. C. TOMLINSON, HON. SECRETARY, MINE MEDICAL OFFICERS' ASSOCIATION (M.A.S.A.), DATED 27 JANUARY 1961, TO ALL MEMBERS OF THE GROUP

## ASSOCIATION TIE

Following a suggestion made some time ago, Dr. H. Le Hellico, at the request of the Executive Committee, has designed a distinctive tie for the Mine Medical Officers' Association, and Messrs. Markhams, Ltd., Johannesburg, have agreed to carry stocks of the tie provided the Association gives them an assurance that there will be sufficient call from members to justify the expense involved in placing an initial minimum order for 12 dozen.

The motif of the design is the torch of knowledge entwined with two snakes superimposed on a pick and shovel in saltire. This motif, in red and gold and half-an-inch square, is spaced at 24-inch intervals on a navy-blue background, and the cost of the tie in pure silk would be 25s. (R2.50). A specimen of the design will be displayed at the February Clinical and General Meetings.

To enable the Executive Committee to reach a decision, will you please let me know in writing before 23 February 1961 (P.O. Box 4609, Johannesburg), whether you would undertake to buy at least one of the ties from Markhams if an order were placed for them. The time required for making the ties would be from 4 to 5 months from the placing of the order.